In This Issue—*The Price Situation*

MOTOR AGE

Volume XXXVIII
Number 15

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, OCTOBER 7, 1920

Thirty-five Cents a Copy
Five Dollars a Year

Sell the Car That "Makes News" Like Essex

ESSEX MAIL CAR BREAKS RECORD

Auto Crosses Continent in Four Days, Fourteen Hours, Forty-three Minutes

Crossing the continent in 4 days 14 hours and 43 minutes, the Essex transcontinental mail car which left San Francisco last Thursday at midnight, arrived in New York last evening. This beats [illegible] record of 5 days 13 hours [illegible]

SET NEW RECORD FOR AUTO MAIL SERVICE

Transcontinental Run in Four Days and Fourteen Hours From San Francisco Ends Here

[illegible] announcement was made today that [illegible] unofficial record for a transcontinental automobile trip was established when a five-passenger touring car carrying United States mail from San Francisco to New York arrived [illegible] yesterday after a run of four days, fourteen hours and forty-three [illegible]

Phenomenal S. F.-N. Y. Run in 4 Days, 14 Hours, 43 Minutes by Touring Car

NEW YORK, Aug. 10.—(The Associated Press.)—Announcement was made today that a new unofficial record for a transcontinental automobile trip was established when a five-passenger touring car carrying United States mail from San Francisco to New York arrived here late yesterday after a run of 4 days, 14 hours and 43 minutes.

An official of the American Automobile Association said today that this was at least one day faster than any previous unofficial record. Postal authorities declared that the machine's time compares well with that of all except the fastest through mail trains.

Dealers Know It Means Success

Essex from the outset has "made news."

Its latest feat in four times breaking the transcontinental record between San Francisco and New York, was carried by the Associated Press and other news services to practically every newspaper in the United States, and to the important papers throughout the world.

And Essex dealers everywhere have profited by the way Essex has made for itself a personality, admired and watched with interest by all.

That is why 19 months after it was brought out, more than $75,000,000 worth of Essex cars were in service.

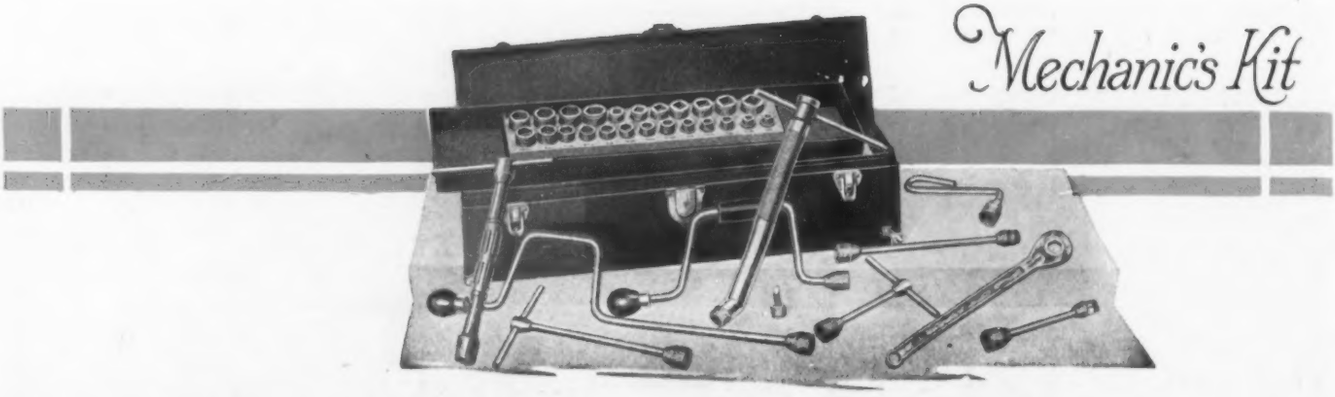
Wouldn't you like to handle a car that [illegible] such outstanding advantages in selling [illegible] And wouldn't you prefer a connection with a company whose permanency is so fortified that you have no uncertainty about your investment of either time or money.

In 4 Trips Across America Essex 4 Times Breaks Record

First Essex	*Second Essex*	*Third Essex*	*Fourth Essex*
San Francisco to New York	**New York to San Francisco**	**San Francisco to New York**	**New York to San Francisco**
—4 days, 14 hrs., 43 min.	**—4 days, 19 hrs., 17 min.**	**—4 days, 21 hrs., 56 min.**	**—5 days, 6 hours, 13 min.**
Lowers Record 12 hours 48 minutes.	Lowers Record 22 hours, 13 minutes.	Lowers Record by 5 hours, 35 minutes.	Broke former Record by 11 hours, 19 minutes.

ESSEX MOTORS, DETROIT, MICHIGAN

Entered as second-class matter Sept. 19, 1898, at the post office at Chicago, Ill., under act of March 6, 1879.



Mechanic's Kit

Universal nose piece on all Billmonts —permits use of any Billmont socket

BILLMONT

Just the wrench you need, just at the time you need it, just where you can put your hand on it. That's what it means to have a Billmont Mechanics' Kit in your garage. It is the right equipment for any car owner who has to tighten or loosen or make an adjustment "right now"—an essential to the garage or repair shop that lays any claim to speedy workmanship.

In a box 24¾ inches long by 6 inches high and 6½ inches deep is contained an equivalent of 192 wrenches. There's the Master Wrench with its hooked nose and strong, long, sliding T bar handle; the Junior just like it with a straight nose, a 12-inch Ratchet that will work in a finger width; the Rim Brace, Speeder, Offset, Short T, Long T and 2 extensions, 6 and 11 inches, that fit all wrenches, an Offset Screwdriver and 24 different sized Billmont sockets, square and hexagon, interchangeable—they just slip in and out of the special Billmont nose piece on each wrench.

Look for the Mechanics' Kit in accessory shops and hardware stores. You will need one.

Edgar C. Guthard Co.

361 E. Ohio St., Chicago

207 W. 76th STREET, NEW YORK 1714 PHELAN BUILDING, SAN FRANCISCO

Western Canada: C. C. Craig & Co., Ltd., Winnipeg

WRENCHES

DEALERS: You will want a Mechanic's Kit for your own work around the shop. The time saved in one week will more than pay for it. And you will want more to display on your counter or in your show case. Mechanic's Kits sell themselves to all who appreciate good tools. Ask your jobber or send for prices

The Waltham Automobile Clock

More Than a Quarter-Million Now in Use as Standard Equipment

Model I-5

Jordan Silhouette Equipped with Waltham Automobile Clock

The Jordan Silhouette is a car that the most fastidious women delight to drive, because of its lightness, its compactness—the ease with which it can be handled.

They enjoy no less its beauty, the excellence of its fittings—and the unfailing accuracy of the Waltham Automobile Clock which it carries as standard equipment.

The Waltham Automobile Clock has a jeweled eight-day movement with two mainsprings, and is so scientifically adjusted that no matter how rough the roads or how changeable the temperature it will maintain its marvelous accuracy.

You will find Waltham Automobile Clocks on cars of the highest class—a privilege that has been accorded them because of their unexcelled time keeping qualities.

List of Cars Carrying Waltham Automobile Clocks as Standard Equipment

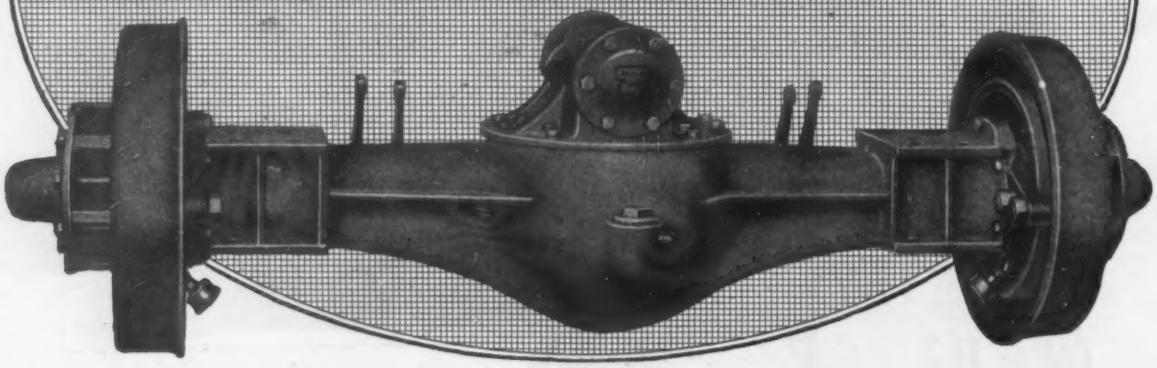
Apperson	Hudson Super-Six	Owen-Magnetic
Argonne	Jordan (enclosed cars)	Packard Twin-Six
Brewster	Kissel	Pierce-Arrow
Cadillac	LaFayette	Porter
Cole	Leach	Premier
Cunningham	Locomobile	Rauch & Lang
Detroit-Electric	Marmon	Stevens-Duryea
Dorris	Mercer	Studebaker
Franklin		Willys-Overland
Hollier		Winton

WALTHAM WATCH COMPANY, WALTHAM, MASS.

WALTHAM

THE WORLD'S WATCH OVER TIME

WISCONSIN AXLES



Wisconsin Worm Drive Axles Achieved Success Through Performance

Thirty-five manufacturers of high grade trucks use Wisconsin Axles. This remarkable sales record is due to the record performance of the product.

Wisconsin axles are the most efficient because they were designed to give the lowest operating costs. The worm gears are 97% efficient which exceeds any other form of gearing. Ball bearings justify their high price, because they transmit more power. The expensive brake design using two sets of drums and shoes means more mileage without renewing brake lining, and also prevents any brake trouble due to grease or oil because they cannot reach the brakes.

Wisconsin axles create a dealer good will that has kept our list of customers growing just as fast as we find ourselves able to take them on.

WISCONSIN PARTS COMPANY

OSHKOSH, WISCONSIN

MOTOR AGE

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E. E. HAIGHT, Manager
DAVID BEECROFT, Directing Editor
RAY W. SHERMAN, Executive Editor B. M. IKERT, Editor

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DETROIT, 95 Fort St., W., Phone Maine 1351
CLEVELAND, 536-540 Guardian Bldg., Main 6432
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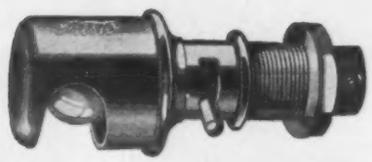
Presto Products

OVER ONE HUNDRED MOTOR CAR NECESSITIES



Presto Dash Lamp No. 655-S

Presto Dash Lamp No. 647-S

TWO LATEST STYLE PRESTO DASH LAMPS

Both styles have proved very popular with all classes of car owners. Each one is handsomely finished in heavy nickel and will be an attractive addition to any instrument board.

DASH LAMP NO. 655-S (New Style)

Designed for use on either metal or wood instrument board—note long threaded shank and individual switch—can be turned on or off at will. This is one of our most popular styles.

DASH LAMP NO. 647-S

Specially designed to make it short as possibe. Suitable for practically all cars. A high grade, serviceable lamp that looks well and is always in order. Equipped with individual switch.

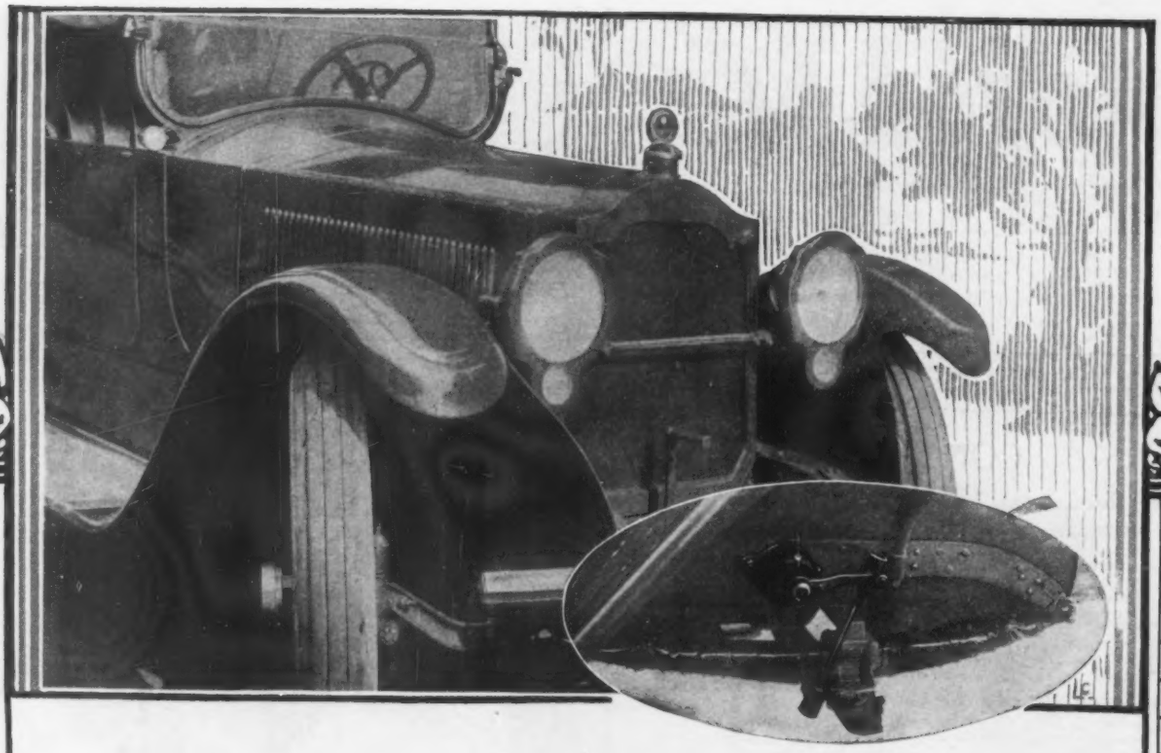
Write for a Presto Catalog

There are over 100 products in the Presto line. Each one is a popular seller.

Your jobber can supply you with Presto Products. Better place your order early.

Metal Specialties Mfg. Co.

338-352 N. Kedzie Ave., Chicago, U. S. A.
Eastern Branch: 16-24 W. 61st St., New York City



There are no rough roads for the Houdaille equipped car

GLIDING over rough roads in a car equipped with Houdaille Hydraulic Shock Absorbers is like skating on smooth ice. Full benefit is derived from the spring suspension, but the jouncing rebound is checked. This means comfort and economy for every car.

The Houdaille is made of the finest alloy steel and is frictionless—having only one moving part operating in a glycerine-filled chamber. It absorbs 75% of all shocks and spring vibrations, preventing body sway and broken springs. There are no straps to break or springs to lose tension; it will not rust or squeak.

HOUDAILLE HYDRAULIC SUSPENSION

Many Packards, Cadillacs, Pierce-Arrows, Locomobiles, Mercers, Stutzs, Jordans, Hudsons, etc., are now equipped with Houdaille—also standard equipment on the American Cunningham and 15 of the leading foreign cars.

Guaranteed for one year from date of installation

THE HOUDAILLE COMPANY

35 ROOT BUILDING **BUFFALO, N. Y.**

Mfgd. by the Houde Engineering Corp.

The Publisher's Service Station

Rendering Service to Help You Render Service

A Little Forethought Now Means Increased Profits Later

Now is an opportune time to be devising means whereby we can keep the business curve from slackening during the coming months.

That MOTOR AGE editors have been giving this subject deep study both from the viewpoint of dealers located where the snow flies and for those doing business in warm climates is shown by the comprehensive program of features that will appear in its November 4 Winter Service number.

Here is a brief outline of some of the things you'll find

What dealers can do to keep their service organizations functioning throughout the coming months.

Tooling Up for Winter Service

This feature will consist of suggestions and plans for holding the men, keeping the shop full, rearranging the service station for greater production, adding new departments such as repainting, body building, rebuilding used cars to bring bigger profits, etc., etc.

Intelligent Use of Advertising

How to advertise for winter service work by writing letters, which will attract the attention of customers and create a desire on their part to visit the dealers' service station.

How to dress up your windows to get winter business.

Using the newspaper intelligently to advertise your business.

What personal talks with customers can do to keep the shop full the year round.

How your showcases can carry a message to customers.

What to advertise to get winter business.

How some dealers keep their places busy the whole year by advertising and promotional methods that line up new customers and retain old customers.

Performing Winter Service

Passenger cars, trucks or tractors at some time in their career must be inspected or repaired and the winter months in those climates where snow abounds is the logical time to go after this business. The Winter Service Number will tell the dealer how to sell service to the man who drives his car, the whole year; to the farmer who wants to have his tractor put in shape for next season's plowing; to the truck operator, etc.

The Exclusive Service Station

There are many service stations and repair shops which look after the maintenance work only. Such places can cash in on winter business and the Winter Service Number will contain articles to tell how it can be done.

What to Promote and How to Sell It

Sell and install winter tops, car heaters, carburetor heaters, primers, etc., etc.

Battery and Tire Service

What the Battery Service Station and Tire Service Station can do during the winter months to get additional business.

Other Features of this Number

How to build bodies for old cars to bring them up to date and thus make it possible to sell them more readily. This article will tell exactly how an inexpensive body can be built in the average shop. There will be complete plans, specifications, etc.

What to do to your building to get better heating, ventilation, etc. Changes you can make in the layout of the shop, service floor, parts department to aid in winter service work.

Things to speed up winter service work. Shop kinks, special equipment which will insure turning out work efficiently.

What to do to cars that are to be stored over the winter.

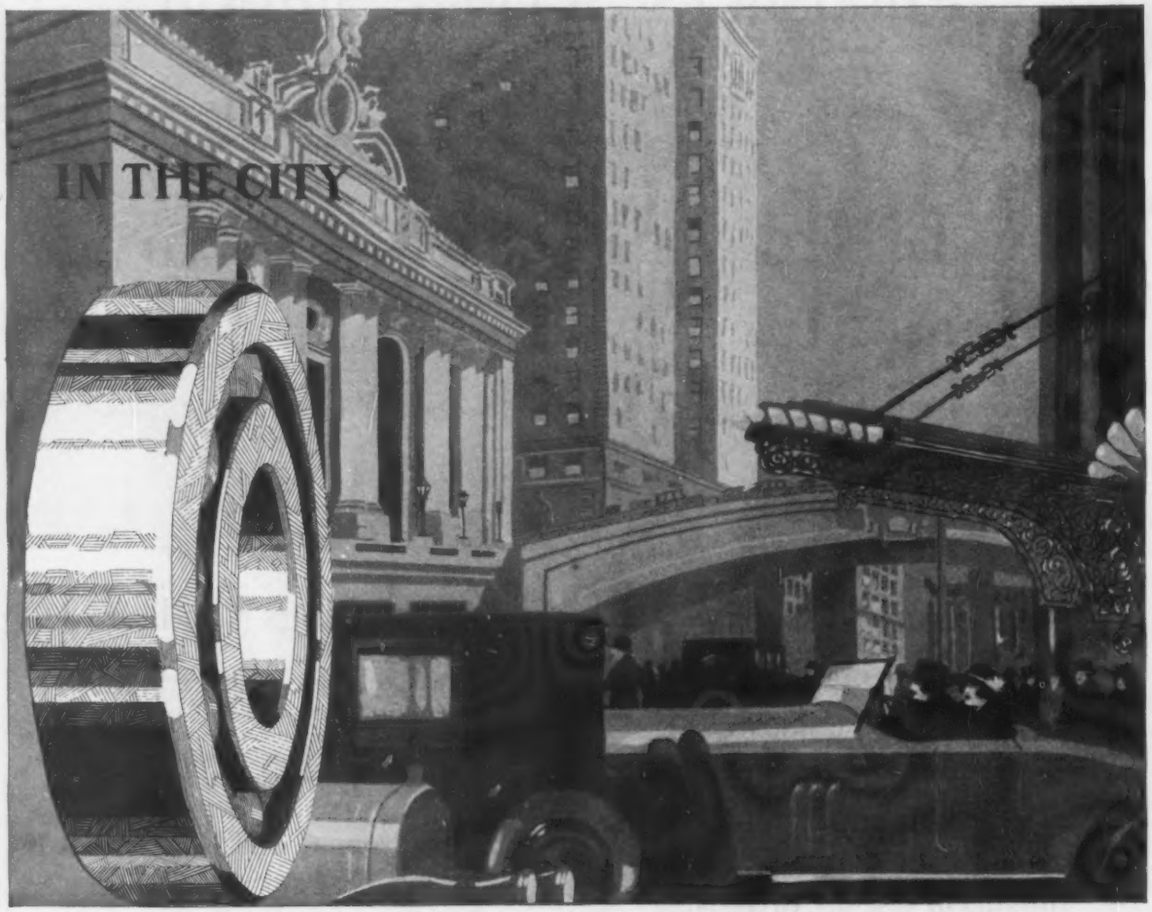
Equipment to speed up winter service.

Charting costs.

Methods for bringing in disabled cars.

And the regular departments plus the advertising announcements of up-to-date equipment and latest things in accessory line.

WATCH FOR THE WINTER SERVICE NUMBER NOV. 4, 1920



1909 *The Sign of Service* 1920

Means your assurance of quick Service and Quality

AHLBERG GROUND BEARINGS

are the best in the field. Our new Bearing Service carries only the best makes of new bearings.

See Our Nearest Branch.

AHLBERG BEARING COMPANY, 317-327 E. 29th Street

Chicago, Illinois

BRANCHES:

Atlanta, Boston, Brooklyn, Cleveland, Detroit, Kansas City, Los Angeles, Minneapolis, Memphis, New York, Philadelphia, Portland, Pittsburgh, Omaha, Providence, San Francisco, St. Louis, Cincinnati, New Orleans.

OCT 12 1920
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Vol. XXXVIII, No. 15 CHICAGO, OCTOBER 7, 1920 $5.00 Per Year

MOTOR AGE

Price Reductions Tending to Stabilize and Stimulate Industry

Increased Volume of Business for Dealers Offsets Any Present Losses — Bankers' Statements Indicate That Credit Will Be Easier for Dealers

There Is This Thought for Every Salesman to Pass On to His Prospect:

THERE is a possibility, and the remark is based on intimate knowledge of the industry, that some manufacturers may have to increase their prices inside of six months. Some of the manufacturers who have cut prices are selling their cars at less than cost, or so close to it that the profit is negligible.

These losses, however, will be carried on the 1920 books and will, to a certain extent, come out of what would otherwise be paid as an excess profits tax. But when January 1 passes and a new year begins the manufacturers must plan for a full year—AT A PROFIT— and if prices of materials and labor don't come down enough to justify the price the only solution is an INCREASE IN PRICE. You can readily see what may happen with these conditions existing. Nearly all of those who have reduced their prices have, in a measure, taken a gamble on lower material prices, and if they don't get them they have only two courses. To raise prices or operate at a loss or a short profit.

OF course, the shows will aid materially in bringing back business, and every town should make plans for a show sometime this winter. It would also be advisable to make advertising plans at once. Set aside a certain amount of money and prepare to spend it between now and January 1. Get your prospect lists in shape and start your sales machinery.

CHICAGO, Oct. 1—Conditions in the industry along Automobile Row are somewhat better. The period of watchful waiting is rapidly passing with declarations on the part of car manufacturers of definite policies. Guaranteeing prices of cars, where no reduction has been made, has been helpful in its stabilizing effect. Extensive advertising is being resorted to by dealers. Used cars are having some difficulty in being moved.

One of the bankers of the city finds that the reduction in prices of automobiles together with a sharp lowering of prices in various wholesale lines "is a development of immense significance and makes for reduced pressure upon credit facilities and the release of buying power held back during the period when abnormally high merchandise prices prevailed. Ir this matter orderly deflation will be accomplished and the serious evils arising from the war-time inflation are being systematically eliminated."

Lexington Advances $100

CONNERSVILLE, IND., Oct. 1—The Lexington Motor Co. announces that effective to-day the price of its touring car advances $100. The Lexsedan advanced $200 Sept. 10. The company states that the advances are made in line with its policy of basing its price list on cost plus a reasonable profit for dealer and maker.

Buick Guarantees Reimbursement

FLINT, Mich., Oct. 1—The Buick Motor Co. has guaranteed reimbursement to its dealers in case of price reductions before July 1, 1921, on new unused cars on hand not more than thirty days. It is unlikely that the prices will be decreased before July 1, 1921.

ST. LOUIS, Oct. 1—Russel E. Gardner, president of the Gardner Motor Co., has made the following announcement: "The price of the Gardner light four will be reduced, effective Oct. 1, as follows: touring car and roadster from $1,285 to

$1,195, sedan from $2,345 to $2,145. The Gardner light four is not a war product and has never had an inflated price. The manufacturers for the present will be selling at cost. The Gardner Motor Co. has decided to make this reduction not because such a step is in any way justified by their present manufacturing conditions but because they have recognized a widespread sentiment on the part of the American public for a general reduction and in anticipation of the cooperation of their sources of supply desire to assist in an attempt to bring this about."

New Paige Prices

DETROIT, Oct. 1—Prices on the Paige car, manufactured by the Paige Motor Car Co., were reduced to-day as follows: Small roadster, from $1925 to $1770; small coupe, $2775 to $2525; five passenger sedan, $2875 to $2645; five passenger touring, $1925 to $1770; four passenger sport, $2165 to $1990; seven passenger touring, $2995 to $2795; Larchmont second, $3095 to $2895; seven passenger sedan, $3995 to $3750. In making the announcement of price reductions, H. M. Jewett, president of the company, said:

"There are no economic grounds to justify these reductions in prices. The price of Paige cars has always been based on the cost of first class material, best workmanship and fair profit. The material from which cars are being made was purchased some months ago. There has been no reduction in cost since then. Basic factors like steel, transportation and coal have gone up.

"However, to begin what means at this time a worthy movement and to contribute a telling blow at the high cost of living, the Paige is willing to make its own sacrifices and at the new prices we are announcing, cheerfully accept a loss."

Nash Policy Will Be Present Prices Until July 1, 1921

KENOSHA, WIS., Oct. 1—C. W. Nash, president of the Nash Motors Co., says:

"The policy of the Nash Motors Co. will be to absolutely maintain its present prices to at least July 1, 1921. This does not imply that there will be a reduction at that time as, viewing the future as I do now, any reduction then would depend entirely on any reduction in the cost of materials and labor at that time. This statement does not obtain against any increase in the prices of our product."

LINCOLN, NEB., Oct. 1—The Patriot Motors Co., manufacturers of the Patriot motor trucks, announce a reduction in price of their models as follows: 1500 to 2500 lb. capacity from $1990 to $1785; 3000 to 5000 lb. capacity, $2785 to $2450; 5000 to 7500 lb. capacity, $3845 to $3450. These prices become effective immediately and also apply to all goods in transit. In making the announcement the company says:

"We have made this reduction not because cost of material and of production warrant it but because through the announcement of reductions in the passenger car field, dealers and prospective owners alike felt a hesitancy in placing orders and we believe that with the substantial reduction made by us we will actually stabilize our trade so as to enable us to keep our organization together."

MOLINE, ILL., Oct. 1—A cut of $200 has been made in Model 34 Velie, according to an announcement by the Velie Motors Corp. The 34 will now sell at $1385. With the reduction, the company states that cord tires will replace fabric tires as part of the standard equipment. The large Velie has been reduced $100, to $1885, but fabric tires are continued as part of the standard equipment.

Peerless May Raise Prices

CLEVELAND, Oct. 1—R. G. Schmunk, sales manager of the Peerless Motor Car Co., has sent this telegram to all dealers: "The policy of pricing Peerless product has been fair to the purchaser and no attempt has been made to establish the very high prices which have been possible since the war. This policy will be evident to you by comparing Peerless prices with the prices charged for competing products during the entire cycle of advancing prices and at the present time.

This policy has resulted in an excellent demand from users and has prevented accumulation of excessive stocks. Costs are still rising and it may be necessary for us to again increase our prices although we hope this will not be necessary. We can not reduce prices under present conditions and do not intend to do so."

CHARLES CITY, IOWA, Sept. 30—The Hart-Parr Co. have announced that it will protect all purchasers of their tractors against a lowering in price before June 1, 1921. If, through reduction in manufacturing costs, they are able to cut the price of their tractor before next June they guarantee to refund to owners who purchase tractors between now and June 1 the full amount of the reduction. They hold to the opinion that lower prices in manufacturing must be based on lower prices in raw materials and the stimulating of quantity production.

These Cars Have Reduced in Price

Bell, Bour-Davis, Chalmers, Chandler, Cleveland, Crow-Elkhart, Essex, Franklin, Gardner, Hudson, Locomobile, Maxwell, Mercer, Moon, Overland, Paige, Studebaker, Willys-Knight, Velie, Jordan, Maibohm.

These Trucks Have Reduced

Bour-Davis, Patriot, Standard, Stewart.

These Cars Have Increased

Haynes, Lexington, Pierce-Arrow, Roamer.

New Maxwell and Chalmers Prices

DETROIT, Oct. 4—Reductions in the prices of Maxwell and Chalmers cars have been made as follows: Maxwell, touring car from $1,155 to $995; roadster, $1,155 to $995; sedan, $1,895 to $1,695; coupe, $1,795 to $1,595. Chalmers, five-passenger touring car from $1,945 to $1,795; roadster, $1,945 to $1,795; sport cars, $2,145 to $1,995; four-passenger coupe, $2,645 to $2,595; sedan, $2,795 to $2,745; seven-passenger touring car, $2,095 to $1,945.

SHREVEPORT, LA., Sept. 25—W. F. French, president and general manager of the Louisiana Motor Car Co., makes the following statement:

"We are announcing to-day new prices on Louisiana Motor Car Co. products. Bour-Davis seven-passenger touring car which was $2875, new price $2585; Bour-Davis five-passenger $2825, new price $2535; Bour-Davis three-passenger roadster $2875, new price $2585; L. M. C. 2½ ton truck $2950, new price $2540, effective at once."

NEW YORK, Oct. 4—The Lee Tire & Rubber Co. has announced an immediate price reduction of 15 to 20 per cent below present price lists. It is stated that this early price reduction is not in the nature of a cut price on odd or over-stocked sizes of Lee tires but covers the entire line, fabric, cord, puncture-proof fabric and the new Lee cord puncture proof and puts Lee tire prices back where they were before the general tire price advance of March 8 went into effect.

KALAMAZOO, MICH., Oct. 1—The price of three models of the Roamer car have been advanced $100 each by the manufacturers, Barley Motor Car Co. The new prices are guaranteed until Jan. 1.

Jordan and Maibohm Prices

CLEVELAND, Oct. 1—Two more Ohio automobile concerns, the Jordan Motor Car Co., of this city, and the Maibohm Motors Co., of Sandusky, have announced price reductions. Jordan cars are reduced from $200 to $250 and Maibohm,

$120 on all models. The Jordan sport roadster and five passenger cars sell for $2650 under the new rate as compared to the old price of $2850. The Brougham and the five-passenger sedan model will sell for $3700. The former price was $3950. The seven passenger touring car will sell for $2875. The old price was $3075.

OTTAWA, ONT., Oct. 1—L. M. McCoy, manager of Just Motors, Ltd., states that there is an evident attitude on the part of Canadian purchasers to expect reductions in the price of Canadian Fords equal to the price changes which had been made effective in the United States. He pointed out that similar cuts were not possible for the reason that the war tax in Canada is 15 per cent and there is an additional sales tax of 2 per cent. The Canadian Ford Co. has announced a reduction of $100 in the one passenger model, $65 in another and $125 in the price of the chassis he said.

National Will Refund to Dealers If Price Goes Down

INDIANAPOLIS, Oct. 1—The National Motor Car & Vehicle Corp. has announced a price guarantee covering all National sextet cars until July 1, 1921. Distributors and dealers of the National company have been informed that while no reduction in the prices of National cars was contemplated they were authorized to guarantee all retail buyers that if any reduction was made the factory would refund the amount of such reduction until the first of July.

YORK, PA., Oct. 1—The Bell Motor Car Co., Inc., manufacturers of Bell motor cars, announce the reduction of price of the Bell car from $1595 to $1495, effective at once.

Dorris Contemplates an Advance

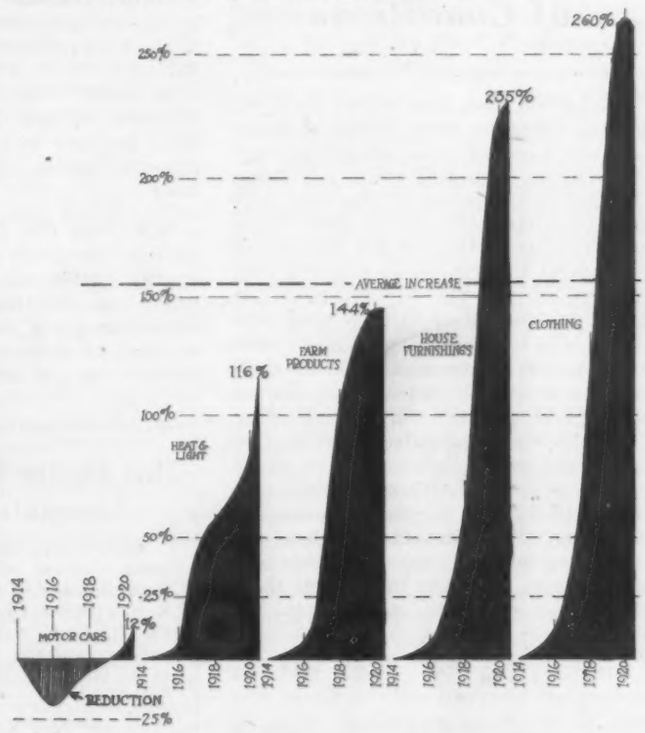
ST. LOUIS, Oct. 4—The price of the Dorris motor car will not be reduced now or during the six months beginning Oct. 1, according to a bulletin sent to distributors by Webster Colburn, vice-president and general manager of the company. Mr. Colburn said:

"We were considering an advance in the price of the Dorris. The cost of production has not diminished and no reason for a reduction in price appears to us. As the price of our product has not advanced to the point which would give us the full warranted profit, we were considering an advance and we may still make this advance.

"A stampede similar to the one now attracting attention took place early in

That the Prices of Motor Cars Have Never Been Inflated Is Shown by Comparison with Price Increases in Various Commodities Based on 1914 Valuation

The chart at right shows the stability of the motor car market. A general increase of twelve per cent extended over a period of six and one-half years, or an increase of less than two per cent per annum, proves inflation has been a thought furthermost from the minds of automotive manufacturers. Contrast these conditions with increases from 116 to 260 per cent in other commodities. In view of the slight increase in automotive prices general and marked reductions should affect the automotive industry last



1919. Several factories reduced their prices with considerable display. These factories soon thereafter quietly restored or increased their prices and no large and permanent reduction in automobiles prices resulted. I believe the same conditions will follow the present reductions."

Oakland Assures Dealer Reimbursement

PONTIAC, MICH., Oct. 1—The Oakland Motor Car Co. says: "In the event of unexpected reductions in the cost of labor and material that enter into the construction of the Oakland Six to a point where we may properly and legitimately reduce the list price of our cars between Oct. 1, 1920, and May 1, 1921, we will refund to every Oakland purchaser who buys within the above mentioned period of time the amount of such reduction."

CLEVELAND, O., Sept. 29—Two hundred dollar reduction in the price of Chandler automobiles was announced today by the Chandler Motor Co. and a $150 reduction in the price of the Cleveland car was announced by the Cleveland Automobile Co. F. C. Chandler, president of the Chandler Company, said the reduction applied to every make and became effective at once. Chandler touring cars are reduced from $2095 to $1895.

NEW YORK, Oct. 1—Emlen S. Hare, president of Hare's Motors, the operating company for the Locomobile, Mercer and Simplex companies, in announcing a reduction in the price of the first two named cars, has issued the following statement: "It is our belief that the spirit of the times demands a reduction in prices so that the purchasing value of the dollar may be increased to a point where there is sufficient buying power to properly finance the business needs of the country. It is with this in mind that we have reduced the price of the Locomobile $1350 and the Mercer $1000 per car." The reduction is effective to-day.

ST. LOUIS, Oct. 4—The Moon Motor Co. announces the following cut in prices: 6-42 touring from $2185 to $1885; 6-42 roadster, $2285 to $1985; 6-48 touring, $2385 to $1985; 6-48 roadster, $2485 to $2085; 6-48 sedan, $3385 to $2985; 6-48 coupe, $3385 to $2985; 6-68 touring, $2950 to $2485; 6-68 sedan, $3950 to $3485; 6-68 coupe, $3950 to $3485; 6-68 roadster, $3050 to $2585.

Stutz Guarantees Prices for Six Months

INDIANAPOLIS, IND., Oct. 1—The Stutz Motor Car Co. has guaranteed its present price against any reduction for the next six months.

CINCINNATI, Oct. 1—Dealers state that the banks are showing more leniency in the matter of financing sales and, on the other hand, the banks claim they have always been willing to take good motor paper and that conditions are no different now from what they have been right along as far as the banks are concerned.

Nationwide Survey of Conditions

ST. LOUIS, Oct. 2—Bankers here say that the reduction in the prices of motor cars will have no effect on the attitude of the banks regarding motor car loans. The fact is the banks in this city have stood by all commitments to their dealer customers, regardless of the attitude of the Federal Reserve banks and will continue to do so. The bankers have felt that it was their duty to keep faith with dealers who had obtained allotments from manufacurers of motor cars and have advanced money to these legitimate dealers as they had agreed to do.

Dealers whose factories have not reduced the price of their cars have joined together in a joint advertising campaign which will begin in the daily newspapers next week. This campaign will have for its purpose the education of the public to conditions in the trade and to tell them why prices on such cars cannot be reduced.

WILMINGTON, Del., Oct. 1—Local bankers say the reductions in prices will have no effect on automobile loans so far as they can see at this time. No unsecured loans are taken by the banks. The bankers see no local reflection in the motor price reduction.

Dealers representing cars on which prices have not been reduced have mapped out no changed program as far as could be learned to-day. They are pursuing the lines heretofore followed, advertising liberally and carrying on aggressive campaign work through salesmanship efforts.

Increased Sales Effort Helps Business

LOUISVILLE, Ky., Sept. 30—Bankers of Louisville state they see no change in the amount of automobile paper now and what it was two or three months ago and they state the reducion in the price of cars, in their mind, will have no effect whatever on the loans on automobiles.

The conditions of dealers who have not had the prices of their cars cut has in no way changed. They are selling cars but the demand does not crowd them. Most of them are increasing their selling ability to offset the tendency on the part of the public to buy the other cars.

NEW YORK, Sept. 29—Possible price reductions in the automotive equipment field, with their effect on the jobbing business, were discussed by the Eastern Automotive Equipment Association, in quarterly session here today.

Opinion was quite general that reductions would follow the lead of automobiles and other commodities and attention of jobbers was called to the necessity of cutting down overhead or of increasing the volume of business done to avoid decrease of the jobber's net profit, which averages only five per cent in the eastern territory. Difficulty of reducing overhead was emphasized by several jobbers who declared that the cost of doing business was still rising, with little prospect of a turn in the opposite direction unless labor costs are brought down.

BUFFALO, Oct. 1—Bankers of the district declare their policy will be guided by the wishes of the Federal Reserve bank. At the Buffalo branch H. W. Snow states that the reserve system has no wish to interfere with banks taking financial care of their customers as long as the latter are engaged in essential industries.

"In my opinion," he says, "the effect of the automobile price cutting may be temporarily to reduce the amount of loans to dealers. It naturally follows that loans will be reduced in keeping with prices. Both the security and the need are reduced when prices fall. Of course, if the effect of price cutting is to stimulate sales it will not be long before the increased volume of business will overcome the price reductions and former conditions will again obtain. The price cutting came at a time when the banks are carrying a peak load to aid in harvesting and moving the nation's crops. When the crops are harvested and paid for a portion of this load will have been removed."

NEW ORLEANS, Oct. 1—James A. Fortier of the Commercial Credit Co. says that the "reduction of price of cars will make money easier for automobile dealers because they will require less money per car and automobile paper will be more acceptable than heretofore because there will be greater diversification of risk, each loan being smaller."

KANSAS CITY, Oct. 4—Motor car distributors, both of lines cutting prices and lines holding steady, are optimistic, reporting increased business since reductions were announced. Dealers in cars now priced lower have, of course, made sales to those who have delayed for hopes for cuts in car prices. Dealers in cars not reduced continue to point out to prospects that their cars have never been overpriced, and are on stable price level.

This Dealer Makes Personal Guarantees of Prices

Atlanta, Ga., Oct. 1—Following the announcement of cut in prices by Franklin and Ford, the Newson & Kelley Motor Corp., Atlanta, handling the H. C. C. Special and the Gardner, carried the following announcement in all of its newspaper advertising:

"We guarantee to the public that if the prices of the cars we sell should be reduced by their manufacturers during 1920, a refund amounting to the difference will be made by this company on all cars bought between Sept. 26 and Dec. 31."

This was very excellent advertising and a splendid means of showing the prospective buyers that they were protected in case of a reduction, as the Franklin and Ford cuts caused many people in this section to hold off buying at this time in the belief that a general reduction was to be shortly announced.

Bankers State Reductions Will Make Credit Easier

The increased activity in sales and the overcoming of sales resistance by means of lower prices, is stimulating the buying of cars generally dealers say. The position of dealers whose cars are not lower priced is strengthened by their ability to demonstrate the continuing high prices of raw materials and labor. Their position is also strengthened by the public's discovery that retail prices are not dropping generally or radically. Some dealers deprecate the guarantee of prices for any period, because such guarantee causes slump in sales towards close of the period.

Kansas City dealers are perhaps in a favored situation, because of prosperity of the territory springing from unusually large agricultural production.

LOS ANGELES, Sept. 30—The announcement of price reduction on motor cars has paralyzed business here. On those lines that have reduced there has not been a marked increase in business as many prospective purchasers are taking the position that this is but indicative of a further decline. Purchasers know that peak prices were reached by stages of successive advancements, in some cases as many as three and they are expecting prices to come back the same way inasmuch as reduced prices still represent an advance over prices existing before the increases became general.

Dealers having cars on which the prices have not been reduced are advertising heavily assuring buyers of protection against a subsequent decline but at the same time they admit that it is useless now to try and sell cars because of the furore created. Sales forces are demoralized especially where competition was encountered with cars that have lowered prices.

The consensus of dealer opinion is that the entire industry has suffered a severe setback and that there will be little chance for business while the public mind is so disturbed. All dealers at this time are heavily stocked and factory protection on cars bought within the last thirty days will not compensate for the loss in many instances. One of the hardest blows the dealers have suffered is in the automatic reduction of

prices of used cars on hand. Stocks of used cars owned by dealers handling lines on which prices have been reduced are so heavy that the aggregate loss easily approximates a quarter of a million dollars.

A similar effect on exclusive used car dealers handling the same lines increases this loss by an equal amount. Dealers representing cars that have not reduced prices say to-day that it is too soon to formulate any plans for stimulating business and nothing can be done immediately. They are optimistic that within a month the public alarm will ease off and then the solution will be found in sales efforts but the volume of sales is bound to increase. The truck market is not showing the same disturbance as the passenger car.

Some Dealers Guarantee Prices to Buyers

CLEVELAND, Oct. 1—Dealers carrying lines that have been reduced without doubt have a temporary advantage over others whose cars have not been reduced but the latter are arguing to overcome that with the assertion that their prices were not increased as were some during the war and that the others have now come back to an equal basis with the lines not reduced.

At the Federal Reserve bank the credit manager stated that price reductions would not affect the general policy which is that all legitimate demands of all industries will be financed. The vice president of one of the largest banks said that there is nothing in the situation that should cause the dealer or manufacture any alarm. The price reductions are on cars, he said, and his bank did not loan on cars but on financial statements of customers. He also expressed his convictions that the price reductions were a help to the industry and that they would stimulate it, although he was frank to admit that certain manufacturers were so situated that it was not policy for them to reduce until there is a drop in the cost of production.

KANSAS CITY, MO., Oct. 1—Many dealers have arranged to guarantee prices to purchasers and have made efforts to get definite statements from their factories. It is said here that the decrease in prices of Ford passenger cars and trucks will not affect the terms of time sales and that the usual rates of one-third first payment and balance in twelve months will prevail. On cars which Ford dealers have on hand the company will offer rebates to them and make the price equal to present prices.

MILWAUKEE, WIS., Oct. 1—Bankers in Milwaukee say the developments respecting selling prices will not affect their treatment of commercial demands from manufacturers, distributors or dealers. They insist that while it was deemed necessary to cut loans about half several months ago an easier feeling has developed since that time which they believe will continue along that line.

The fact that list prices have been reduced is not of considerable moment from the banker's standpoint excepting insofar as it is expected to result in due time in a stimulation of selling. As the volume of business expands and requirements of dealers increase, the increased requirements of funds to finance the larger volume will be forthcoming, as in other lines of trade.

And, by the same token, due conservatism will continue to be the guide of bankers in providing funds so that undue inflation and speculation will be prevented. The attitude of bankers generally is non-committal when definite expressions are requested to definite questions. Apparently they are awaiting the results of interchanges with other sections before being willing to make public any definite announcement of policies; in fact, it is evident that an effort is being made to refrain from such action of uniformity and continue to treat cases individually upon their merits.

NEW YORK, Oct. 1.—Motor row is in an attitude of "Watchful Waiting." It is just beginning to climb out of the cyclone cellar and take an inventory of the effects of the price-cutting hurricane that swirled eastward from Detroit a few days ago.

The air is still surcharged with conflicting rumors and doubts. The question on everybody's lips is, "Who's next?"

Haynes Announces An Increase

KOKOMO, IND., Oct. 2—The Haynes Automobile Co. announces that effective Oct. 15 the price of its four passenger model will be $3185 instead of $2935 the present price.

DETROIT, Oct. 1—The Standard Motor Truck Co. has announced a reduction of from $225 on 1-ton trucks to $450 on 5-ton trucks.

Winton Will Refund If Prices Are Reduced

CLEVELAND, OHIO, Oct. 1—The Winton Co. has sent to its dealers a guarantee that a refund will be made if prices are reduced before March 1.

Packard Guarantees Prices

DETROIT, Oct. 1—The Packard Motor Car Co. announces that no change is to be made in its prices and purchasers are guaranteed against any reduction before July 1, 1921.

No Marmon Reduction

INDIANAPOLIS, Oct. 1—The Marmon & Nordyke Co. contemplates no reduction in the price of its cars.

Price Reductions Will Cause Tax Loss of Many Millions

Government Receipts Cut $500,000 a Month by Ford Reduction Alone

DETROIT, Oct. 1—Effect on the finances of the country, in the matter of tax returns on automobiles, as a result of the cuts announced recently, will be considerable and it is estimated by Internal Revenue Collector J. H. Grogan that the decrease in taxes in Detroit alone will amount to many million dollars a year.

The Ford cut alone, according to Mr. Grogan, will reduce revenue receipts approximately $500,000 a month. The tax on automobiles is $5 per $100. The average price reduction on Ford cars was $150. On a basis of Ford production of 3500 cars a day, approximately 87,500 a month, this would indicate a revenue cut of around $650,000 a month. Ford production since Sept. 1 has been about 4000 a day which would make the revenue loss approximately between $7,000,000 and $10,000,000 a year on that car alone.

Excess Profits Tax Hit

This is but one item. The price reductions necessarily will cut the profits of the concerns making them with the result that the effect will be felt in the income and excess profit collections from these companies. It is the contention of many persons, and this applies particularly to manufacturers who resent the action of Ford, that he was taking into consideration this saving in income and excess profit tax when he made the reduction and they contend the decrease in the government charges he will have to pay will in a great measure offset the loss occasioned by the reduction.

With the normal production of Maxwell-Chalmers, Hudson-Essex, Paige and the Detroit Studebaker factory, averaging around $2,000,000 a year, on a basis of an average cut of $150 a car, the decrease in war tax alone would be $1,500,000. On some of those cars, however, prices were decreased as much as $250.

Allied Industries Another Loss

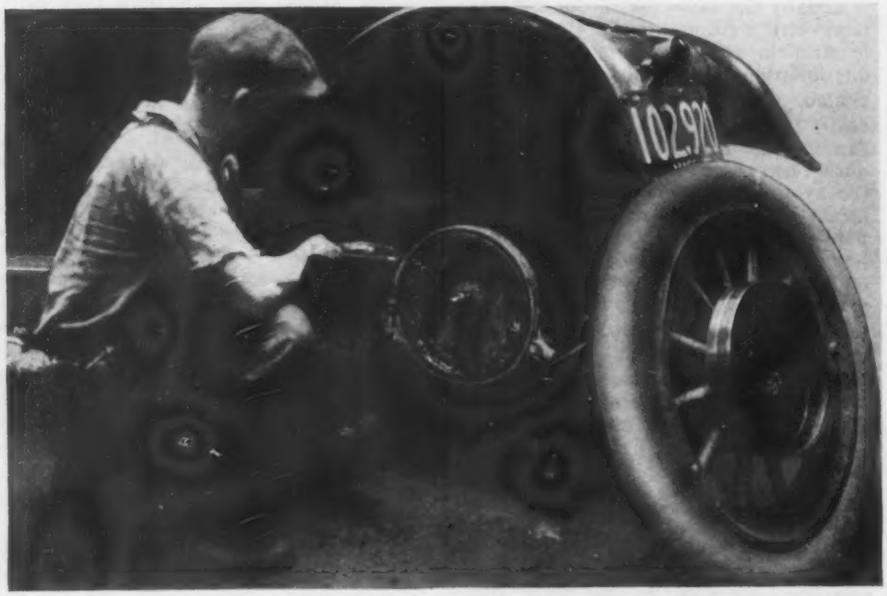
At all events Uncle Sam is going to find his pocket-book greatly depleted as a result of the price reductions in the Detroit automobile factories. This, of course, does not take into consideration the many industries allied with the automobile which are expected to announce price reductions from time to time.

For the fiscal year ending June 30 the automobile tax collected in the first district of Michigan, which includes Detroit, amounted to approximately $45,250,000. During July and August the tax paid was more than $10,000,000.

How to Reline and Adjust Brakes

The Brakes of the Motor Car Are Too Important a Factor of Safety to Be Adjusted or Relined Without Full Knowledge of the Correct Procedure. This Article Goes Into Complete Detail of Each Operation and Should Be Studied and Referred to When Doing This Work

DEALERS and service station managers should take it upon themselves to educate owners to the importance of quick acting brakes and to the necessity of adjusting or replacing the worn out lining. This work should yield a nice profit if done efficiently and one which the owner will be glad to pay. Motor Age is indebted to the courtesy of the Multibestos Co. for the pictures in connection with the instruction.



1—The first operation is to jack up the rear end of the car. In placing the jacks under the rear axle, care must be taken to locate them in such a position that they do not affect the brake mechanism; usually they are pressed against the rear axle housing proper. Making sure that both brakes are completely off the ground, next remove the rear wheels. With the wheels also remove the brake drums. This exposes the entire brake mechanism.

FAST and positive acting brakes are never appreciated until lack of care ruins brake action and an accident results. The dealer and service station manager should educate the car owners to the importance of keeping the brakes in perfect adjustment.

In the first place, if the brakes are to give positive action they must be kept so that when they are applied the brake lining will bear with even pressure on all parts of the drum. The steady pressure and abuse to which the brake lining is submitted causes it to wear down from its original thickness, and adjustments must be made to compensate for the wear.

If the car owner attempts to take up the brakes he will always adjust the rods. Continual adjustment of the rods is bad practice. On both the primary and secondary rods the limit is soon reached. Adjustments of the rods should always be subordinate to those made at the bands and only for the purpose of allowing proper clearance and travel for the equalizer and foot pedal when the bands are rightly placed.

With the rear wheels jacked up, the accuracy of the brake adjustments can be readily checked. One person in the driver's seat should advance the foot pedal to approximately its half-way position. A person at the back of the car can then test the evenness of the drag of the brakes by turning the rear wheels by hand. If the pressure is uniform on both wheels, the pedal should be moved forward to three-quarters of its maximum travel and the test repeated. When the pedal is pushed the full distance, both rear wheels should be firmly locked and impossible to turn. The same check can be made of the emergency brakes through the advancing of the hand lever.

Before commencing any brake adjustment, both rear wheels should be jacked up so they are free to revolve. It is the only position in which the grip of the brakes can be properly tested. In their released position the brake bands should be so adjusted as to leave an open space

2—In order to remove the external brake bands, the adjusting levers must next be loosened and disconnected. These are usually caked with mud and grease; if the connections have not been properly oiled, they may be rusted and hard to take apart. If the emergency brakes are also to be relined, the brake shoes must be removed in a like manner. When the adjusting levers are loosened and disconnected, the entire brake mechanism must be thoroughly cleaned. This includes the brake drums, the external bands and the internal shoes. The parts must be washed in gasoline to remove dirt and grease.

1/64 in. between the lining and the brake drum. This clearance should be uniform throughout the circumference of the drum, otherwise the brake lining will bear unevenly and the wear will be greater at some points than at others.

Means for making this adjustment are provided above and below the spring at the open end of the brake band. It is this spring that keeps the brake lining from contact with the drum when the brakes are set in their released position. Tightening the nuts controlling the spring will bring the open ends of the brake band closer together and the lining closer to the brake drum. Each brake should be adjusted separately and the same amount of clearance provided for each.

Adjusting the Equalizers

Most cars are provided with equalizers which assure the application of the same amount of pressure to each band of the service brakes. Internal or emergency brakes are not usually arranged with such equalizers. Should it be found that one internal brake grips more quickly or firmly than the other, the rod leading to the brake which is not gripping properly can be tightened. In addition to the adjustment of the service brakes described, there are others that are commonly made. On the primary rod, which leads from the pedal to the equalizer bar, there is a turnbuckle by which the rod can be shortened or lengthened. Some cars are also arranged with turnbuckles on the secondary rods, which run from the equalizer bar to the brake bands.

Improper adjustment and poor operating brakes are characterized by certain factors. Squeaking brakes indicate that the brakes are not equalized or, in other words, one wheel is braking ahead of the other. Along with this condition will come excessive wearing of the tires in certain spots. If the brakes are badly unequalized skidding will occur when the brakes are applied. Slipping brakes can usually be attributed to two other things in addition to the lack of adjustment. If grease works out at the rear wheel it will collect and work into the brake lining and, of course, poor action will result. This condition can often be remedied by cleaning the lining with gasoline after the grease leak has been stopped. If the lining is allowed to wear down to the point where the rivets become exposed and the car is driven any length of time under these conditions the drums are very apt to become glazed and this will cause very poor brake action.

3—The next step is to place each brake band or shoe in a vise, chisel off the old rivets, take out the old lining and clear the holes in the band by driving out the rivets with a punch. This done, the brake bands and fittings are examined carefully to make sure that no defects have developed since they were last lined.

It is fair to state that under average conditions it is necessary to reline the brakes after from twelve to fifteen thousand miles. If positive braking is to be obtained the relining will have to be carefully and correctly done. To begin with, the exact size and length of the lining required must be determined. Companies manufacturing brake linings furnish a book which gives the proper sizes to be used.

Place Jack Carefully

The first operation is to jack up the rear end of the car. In placing the jacks under the rear axle, care must be taken to locate them in such a position that they do not affect the brake mechanism; usually they are pressed against the rear axle housing proper. The rear wheels are then removed and also the brake drums which exposes the entire brake mechanism.

In order to remove the external brake bands, the adjusting levers must next be loosened and disconnected. These are usually caked with mud and grease. If the connections have not been properly oiled, they must be rusted and hard to take apart. If the emergency brakes are also to be relined, the brake shoes must be removed in like manner. When the adjusting levers are loosened and disconnected, the entire mechanism must be thoroughly cleaned. This includes brake drums, the external bands and the in-

4—The new lining, cut to proper length and ready to apply, must now be fitted to each band in the manner shown. The lining is clamped to the band and the band is used as a template for drilling the holes. Care must be taken in drilling to see that the holes in the new lining register accurately with the holes in the brake band.. Otherwise, the lining cannot be attached snugly to the band.

5—In riveting the lining to the band, the main point is to have the lining smooth and snug. In the photograph is shown a method by which the mechanic may get a snug fit of the lining to the band. The lining and band are fastened by clamps or bolts at both ends; this leaves a slight bulge in the center. When the bulge is pressed down, it brings the whole lining tight against the band. The riveting is started at one end and is carried on progressively to the other end. When the rivets are inserted through the lining and band, they project about ⅛-in. through the band. The heads of the rivets are allowed to rest against a metal surface, and with a few light blows the ends of the rivets are flattened until the lining is held tightly to the band. Solid rivets are used for the end holes; tubular rivets are used for the balance.

ternal shoes. The parts must be washed in gasoline to remove the dirt and grease.

The next step is to place each brake band or shoe in a vise, chisel off the old rivets, take out the old lining and clear the holes in the band by driving out the rivets with a punch. This done, the brake bands and fittings are examined carefully to make sure that no defects have developed.

The new lining cut to proper length and ready to apply, must now be fitted to each band in the manner shown. The lining is clamped to the band and the band is used as a template for drilling the holes. In some cases it is possible to purchase linings that have the holes drilled and countersunk but in case it is necessary to do this work a very sharp tool should be used to prevent tearing the fabric.

Lining Must Fit Snug

In riveting the lining to the band, the main point is to have the lining smooth and snug. In one of the illustrations, a method for getting a snug fitting of the lining is shown. The lining and band are fastened by clamps or bolts at both ends; this leaves a slight bulge in the center. When the bulge is pressed down it brings the whole lining tight against the band.

The riveting is started at one end and is carried on progressively to the other end. When the rivets are inserted through the lining and the band they should project about ⅛ in. through the band. The heads of the rivets rest against a metal surface, and with a few light hammer blows, the ends of the rivets are flattened until the lining is held tightly to the band. Solid rivets should be used for the end holes; tubular rivets for the balance. The same method is followed in relining the internal brakes except that the riveting is started at the center and is carried out to both ends.

After the lining job has been completed, the next problem is to adjust the brakes so that when they are applied, the new lining will bear with even pressure on all parts of the drum. The brakes must first be adjusted at the point of anchorage and must be brought to the point where they are barely free from the drum. The lower half of the band must be next adjusted; it must be brought to the point where they are barely free from the drum. The lower half of the band must be next adjusted; it must be brought to the point where the drum runs free. Then the upper half must be adjusted to the same point.

The brake band must be set as close to the drum as possible without dragging. This clearance need not be greater than 1/64 in.; but it must be uniform throughout the circumference of the drum, or the new lining will bear unevenly, causing excessive wear. The method for checking the brake adjustment as previously outlined is followed. To determine whether the lining is making contact on the entire circumference of the drum, the pedal is pressed down to the half way position and a piece of shim stock used to feel for openings between the lining and the drum.

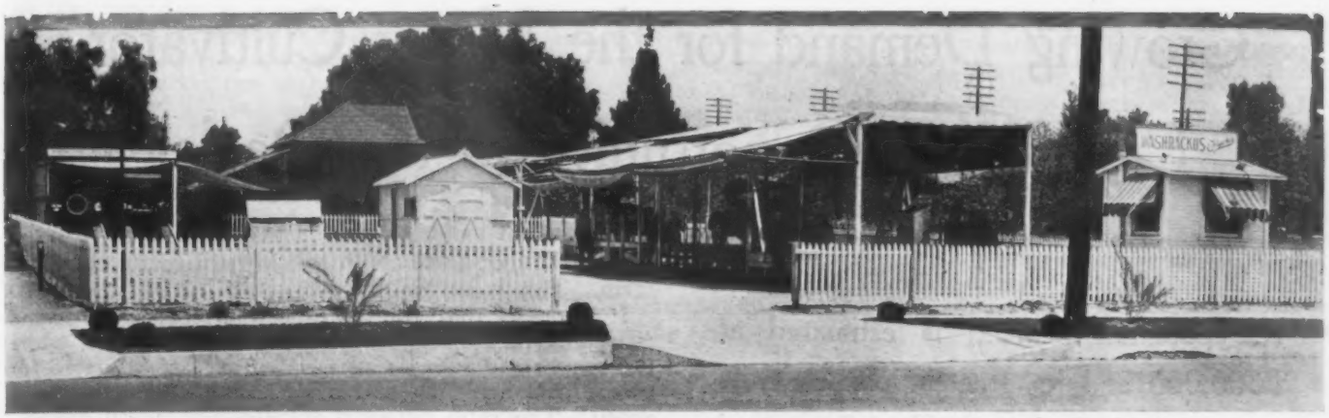
6—Replace the brake mechanism. Examine the wheel bearings to see if they are tight (otherwise the brakes will be out of line). Put on the wheels. The brake band must be set as close as possible to the drum without dragging. This clearance need not be greater than 1/64-in.; but it must be uniform throughout the circumference of the drum, or the new lining will bear unevenly, causing excessive wear. After making the adjustments, oil all the levers and connections of the brake mechanism.

ASSOCIATION HEARS ROY PEED

Philadelphia, Oct. 1—The first meeting of the season of the Automobile Accessories Business Association of Philadelphia was held last month at the rooms of the Philadelphia Automobile Trade Association when an address was made by Roy Peed of New York. Mr. Peed spoke on business conditions and prospects on car sales and summarized what the N. A. C. C. was doing in encouraging the automobile dealers to obtain a good standing with their bankers. The next meeting of the association will be held Oct. 15.

DEALERS TO DISCUSS CAR SALES

Kansas City, Mo., Oct. 1—The Automobile Trade Association of Kansas, representing the automotive dealers of the state, with a large membership will hold its annual convention at Salina, Kansas, Oct. 20, according to advices received by the Kansas City Motor Car Dealers Association during the past week. Topics that will be discussed at the meeting will be car sales, tire and accessory sales and publicity. A. L. Olinger is secretary of the association.



Above and to the right are views of the "Auto Laun dries" of the Universal Service Co., Los Angeles, where cars are oiled, greased and washed while you wait

If You Service Cars—

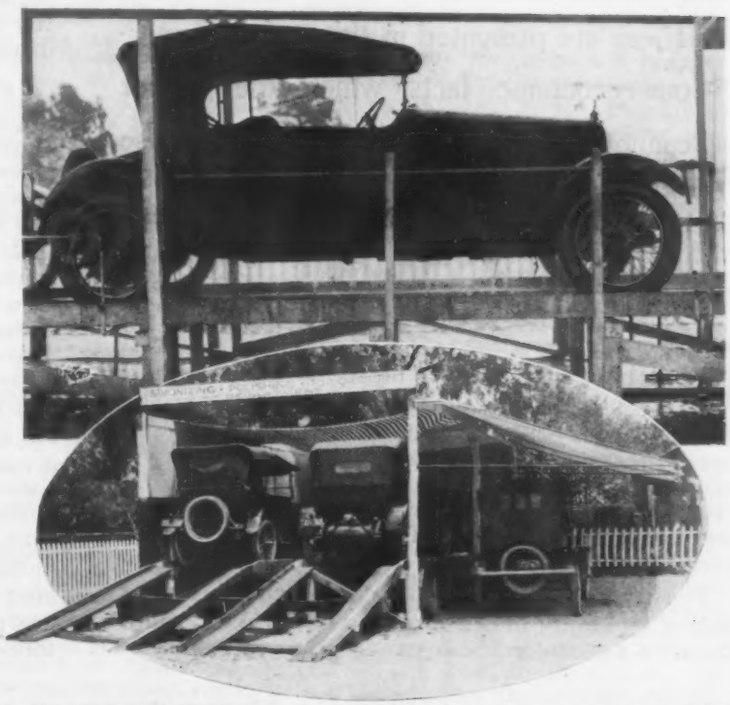
YOU can relieve that congested condition in your shop by building racks or trestles for lubricating your customers' cars. Or, you can make good of that vacant space behind or at the side of your garage by installing one or more of these oiling racks and by thus placing part of your service work on the outside of the building where it catches the eyes of motorists, you can add to your profits from doing work generally inconvenient to perform in service stations.

If You Want to Make More Money—

ONE of the branches of the service end of the automotive trade that could profitably be singled out and given exclusive attention is oiling and greasing of cars, an item of high importance to the individual motorist.

Oiling and greasing racks, preferably in an open-air space, which loom invitingly before passing motorists, represent a line of service that should become more and more popular and should be given attention by dealers or garages interested in more sources of profit.

C. W. Harden and H. K. Myers, of Seattle, Wash., saw the possibilities that were offered in the oiling and greasing of automotive vehicles and established racks in an open-air space. After opening their establishment they launched a vigorous educational campaign by the distribution of literature among



motorists, calling attention to the urgent necessity of keeping cars properly oiled and greased in order that they may yield maximum service. The campaign was productive of very substantial results almost from the very start.

(Concluded on page 51)

HOCO AUTO PARK
DAILY WEEKLY AND MONTHLY STORAGE
YOUR CAR OILED AND GREASED WHILE YOU WAIT
The Standard Oil For Motor Cars
SERVICE OILING RACKS
The Standard Oil For Motor Cars

Lubricating racks of C. W. Harden and H. K. Myers, Seattle, Wash., showing the attractive signs to draw attention of passing motorists.

Growing Demand for the Motor Cultivator Presents an Opportunity to the Dealer

The potential demand is estimated at 2,500,000 and its greatest popularity is confined principally to the Corn and Cotton Belts

There are presented in this article numerous economic facts which the farmer cannot ignore when placed before him. Use them in selling

DEVELOPMENT of the trade possibilities of the motor cultivator will be the next important accomplishment in the tractor industry. The signal is about to drop which will start a competitive race between the tractor and the motor cultivator to see which will go the farther in driving Old Dobbin off the farm. Close students of the possibilities are of the opinion that the cultivator will go much farther than the tractor ever has been able to go.

The tractor was first in the field and has demonstrated its ability in this direction until it is possible to say with a considerable degree of definiteness just what it can do. It has been proven that the tractor will, on the average, displace about two horses on the corn belt farm. This is its limit.

It happens that the average quarter section farm, especially in the corn belt, maintains six horses, while the number of animals, as a rule, increases by two for every forty acre increase in the number of acres cultivated. The ratio between acreage and horse population is somewhat different in sections where small grains predominate, but it is not so markedly different as to necessitate a change in stating the fact. It may be accepted as the general rule that on all farms over 160 acres and up to 640 acres, the number of horses will increase by two for every forty acre increase in size.

AS the ordinary three-bottom agricultural tractor displaces but a fraction over two horses per farm where a tractor is owned, it is evident that if more horses are to be displaced some other form of motorized equipment must be relied upon. The motor cultivator fills this need.

Indeed, as a substitute for horses it may be expected confidently that the motor cultivator will go farther than the tractor ever has gone or ever will go. This is due to the different, and many times exclusive, sorts of work the motor cultivator will do as compared with what a tractor will do. Furthermore, the work a motor cultivator can do is just that portion of the farm work for which horses must be retained when only a tractor is owned. In the corn belt this, for the most part, consists of corn planting and cultivating.

The same conditions exist as respects cotton where that staple is grown. In other words, without the motor cultivator horses are absolutely necessary for both primary crops, corn and cotton, and only relatively less necessary for other row crops such as potatoes and tobacco.

HOW necessary horses are for row crop work was brought out recently in connection with an investigation into the displacement of the horse by the tractor undertaken by the United States Department of Agriculture. In the course of this investigation it was determined that the average tractor in the corn belt displaced a fraction over two horses per farm, as already stated.

In view of this fact the conclusion of the department was that until the farmer accepted the motor cultivator or some other form of motorized equipment adapted to the handling of row crops, it would be necessary for him to retain a sufficient number of horses to take care of this part of his work. What this means to the corn belt farmer, as well as to the cotton belt farmer, is indicated by the work problem which confronts a corn belt farmer on an average 200 acre farm.

A diagram showing the necessary work on such a farm for the months of April, May, June and July of every year shows a total of 4800 hours of horse work. Now it happens that these are just the months during which corn and cotton must be planted and cultivated. So many hours of work during these particular months cannot be compassed by the ordinary agricultural tractor because that machine is not adapted to perform them. They are essentially hours of horse work.

One Horse to Twenty Acres

Now note what that means. In the past it has been the custom to figure one horse to every twenty acres of corn. The government investigation disclosed the fact that the average is considerably below this, more nearly one horse to fourteen acres of corn. This operates to multiply the number of necessary horses correspondingly.

However, taking this particular 200 acre farm as an instance, the government estimated that six horses could do the work. This meant 800 hours work for each horse—eighty ten-hour days. As there are only 101 days between April 1 and July 10, the period considered, every horse would have to work a full ten hours on nearly every working day during that period. As the average farm horse works but 100 days out of 365, it is evident that this is asking more of these six horses than they ordinarily could do.

Compare this with the working capacity of a two-row motor cultivator. Actual experience has demonstrated that one man with a two-row motor cultivator can take care of from ten to twenty-five acres of corn or cotton in a ten-hour day, according to circumstances. Furthermore, the machine can do this day after day without let up or fatigue when the soil is in fit condition to work, and a motor cultivator can always work under conditions which are favorable to a horse. It must be evident that on the typical 200 acre farm two such machines, with two men, easily could do all the work three men and six horses could do.

Compare also the relative cost and investment. The government figures the value of the average farm horse of the present day at about $161. It says, too, that it costs $142 a year to feed him. Add these together and multiply by six

and the investment in horse flesh and feed is more than $1800. Two of the most expensive of the motor cultivators now on the market can be bought for this amount and will last the farmer at least five years. Even the most expensive of the general purpose tractors now available, and able to do plowing and fitting in addition to the row crop cultivation, will hardly cost more.

Saving Money for the Farmer

It is dollar and cent considerations such as these that are appealing to the farmer these days and to which he is inclined to lend an attentive ear. No one realizes more keenly than does he how relatively inefficient his horse is as a farm motor, nor does he neglect to consider the overhead cost of its maintenance. But what is he to do? As a row-crop farmer he has to have horses, and a good many have concluded that inasmuch as horses in such numbers must be kept for row crop work, all might as well be kept and the tractor ignored. This actually has militated against the development of the tractor trade and has retarded the sale of tractors in many instances.

But with the motor cultivator as a practicable and dependable substitute for horses, and it is both in its present stage of development, the farmer easily can be persuaded to adopt it and there comes in consequence to the tractor dealer the opportunity to extend his activities in the line of motorized equipment for the farm which is as great as ever he had with the tractor alone.

Of course, it must be understood that some qualification of the above statement needs to be made. The potentialities of the motor cultivator trade exist only in those sections of the country in which row crops occupy a considerable percentage of the cultivated area. Manifestly the motor cultivator trade will be at its minimum in sections where row crops are scarce, although the machine can be used for so many other purposes that even in these sections it is worth the attention of the dealer. But the full possibilities for the motor cultivator are presented principally in the corn and the cotton belts and it is in such sections that it is destined to the greatest use and popularity.

Meets An Obvious Need

Once the dealer gets a clear comprehension of the adaptability of the motor cultivator to the needs of the row crop farmer, and once he perfects his selling campaign, he will find that it is much easier to sell than was the tractor. This is so because it meets a more obvious need than did the tractor. Both tractors and horses may be used for plowing and fitting, hence the farmer always had a practicable alternative of choice. But horses alone will suffice for row crop work as this has been done in the past, hence when a substitute which is available is offered and the farmer accepts it he will discard his horses entirely.

This result is inevitable. This much decreases the sales resistance once the sale of motor cultivators is under way because the farmer is quick to see that it will enable him to dispense with that power which is the most expensive and inefficient he can have. Dealers who have undertaken the sale of motor cultivators in an intelligent and energetic way are proving the truth of this by the conspicuous success they have attained.

Admittedly there are not many such dealers as yet. The development of the motor cultivator has progressed slower than did the development of the tractor and as a consequence there have been fewer of them on the market. Up to this time relatively few dealers have taken any great amount of interest in trying to sell them. Those who have, profess themselves to be more than satisfied with results, but the great majority of tractor dealers never have had their attention called to the potentialities of this trade.

The Potential Tractor Demand

Conservative estimates of the potential demand for tractors existing throughout the country total somewhere in the neighborhood of 2,500,000 machines, after making allowance for all adverse factors. The writer is inclined to place the potential demand for motor cultivators at a figure which closely approximates that given to the tractor demand.

Furthermore, the area in which the motor cultivator demand will manifest itself is very much smaller in superficial area than is the area over which tractors will spread, leading to the inevitable conclusion that the tractor dealer in motor cultivator territory ultimately will sell more cultivators, numerically considered, than he will tractors.

One or Two for Each Farm

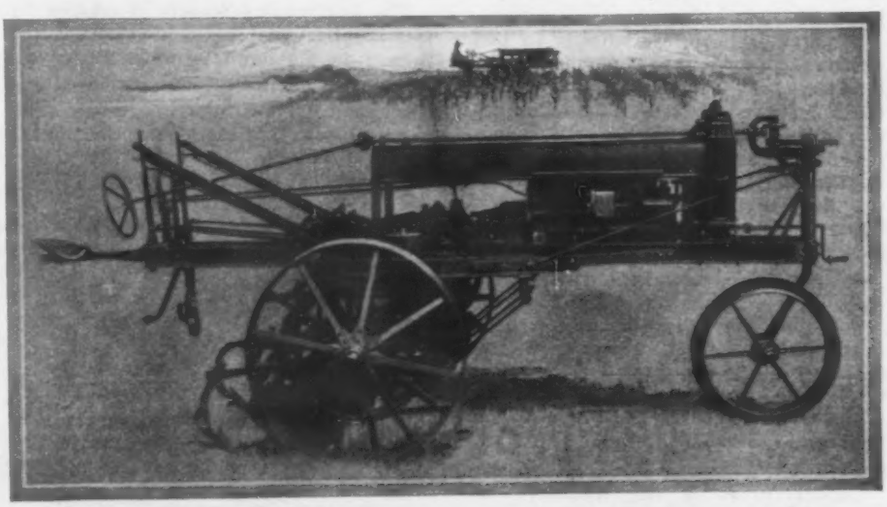
Where is this potential demand? Consider a few facts about row crops. In all some 259,000,000 acres are under cultivation in the United States. About 40 per cent of these, or approximately 149,000,000 acres, are in row crops, the farm value of which is more than 50 per cent of the farm value of all the crops raised throughout the country. There are twenty-three states in particular which are noted for row crops and included within the borders of these states are more than 2,000,000 farms which are of 100 acres or more in size. On every one of these farms there is a present potential demand for at least one, and sometimes for two or more, motor cultivators.

These twenty-three states include only those which in the two primary row crops of corn and cotton are grown, and no consideration is given to such row crops as tobacco and potatoes, for instance. Yet tobacco in cultivable areas adapted to the motor cultivator is grown in seven states, and potatoes are grown to a greater or less extent in nearly every state of the Union, but only in a few in fields big enough to warrant the use of a motor cultivator. Corn and cotton, therefore, present the real potentiality of the motor cultivator demand.

Corn in excess of 1,000,000 acres is grown in twenty-three states, with Iowa leading with 10,000,000 acres and Virginia bringing up the rear with 1,600,000 acres. Cotton is grown in eleven states, Texas leading with over 10,000,000 acres. In fact, in estimating the potential demand for motor cultivators, Texas leads every state in the Union since it has 6,760,000

Where the Potential Demand Is Greatest

CORN in excess of 1,000,000 acres is grown in twenty-three states, with Iowa leading with 10,000,000 acres, and Virginia bringing up the rear with 1,600,000 acres. Cotton is grown in eleven states, Texas leading with over 10,000,000 acres. In fact, in estimating the potential demand for motor cultivators, Texas leads every state in the Union since it has 6,760,000 acres of corn area to add to its cotton area. As a matter of fact, Texas sprang into fourth place as a corn growing state in the year 1919, being surpassed only by Iowa, Illinois and Nebraska, in the order named.



Type of cultivator being manufactured by one of the leading manufacturers. This is of the two-row design and is shown with corn cultivating gangs

acres of corn area to add to its cotton area. As a matter of fact, Texas sprang into fourth place as a corn growing state in the year 1919, being surpassed only by Iowa, Illinois and Nebraska, in the order named.

To the cotton growing area already mentioned must be added the large areas which have been planted to cotton this year in the vicinity of Phoenix, Ariz., and in the Imperial and San Joaquin valleys in California. These last named all are irrigated sections and their importance, due to the quality and value of the staple grown therein, is out of all proportion to their superficial area. Furthermore, they deserve recognition for their motor cultivator possibilities, since the machine has been introduced into the cotton fields of all of them. One firm in Phoenix, for example, sold over 100 motor cultivators for cotton cultivation last year.

The Dealer Must See This Demand

The fact is that every farmer who grows corn or cotton on a farm of 100 acres or more is a present prospect for a motor cultivator. Furthermore, as the farm labor situation grows more acute, as it undoubtedly will, economic necessity will add its influence to inclination and expediency to put motor cultivators onto the farms.

The tractor dealer who cannot see this, and who does not take steps to meet the inevitable, will be left behind in the race. It is not as though this demand existed with nothing practicable and dependable with which to meet it. The direct contrary is the fact. The motor cultivator has proven by repeated demonstration that it is entirely practicable and it is certain that the next great movement in the tractor trade will be in the direction of popularizing it among row crop farmers.

Which Type Will Be Standard?

There remains but one factor to consider and admittedly this is somewhat disturbing. It has to do with an answer to the question: Will the present type of motor cultivator persist, or will some later and more adaptable type be evolved?

Manufacturers differ radically in their answers. A considerable number profess to believe that the ultimate standard type has not appeared. It may be significant that some who hold to this opinion most tenaciously are manufacturers who up to this time have taken no part in the manufacture of motor cultivators, professing to desire to await the development of events.

So far they have contented themselves with watching what the other fellow has done. They say they can see a great future for the motor cultivator, but they decline to have anything to do with it until such time as somebody brings out a model which conforms more nearly to their ideal of what the motor cultivator should be.

Manufacturers in the trade do not appear to be troubled with such scruples and appear to be perfectly satisfied with what they are doing.

EVERY farmer who grows corn or cotton on a farm of 100 acres or over, is a live prospect for the dealer to sell a motor cultivator. No one realizes more keenly than the farmer how relatively inefficient his horse is as a farm motor. But as a row crop farmer he must have horses in number and he figures that if he must have some he may as well have all, a fact which has hindered tractor sales. In this respect the tractor dealer can make a special appeal by selling both motor cultivator and tractor to him.

Probably as definite an answer as can be made at this time is to assert the conviction that future production likely will be along two lines, leaving the character of the work to be done to decide about the adaptability of either type.

Manufacturers now are building small tractors, of which the Avery 5-10, the Shawnee, the Toro and the Traylor may be taken as representatives. At the same time such machines as the Rock Island, Emerson-Brantingham, the Bailor, the Avery and the Parrett, all of which are practically a motorized adaptation of the horse drawn 2-row cultivator, are being put on the market.

Predominate Work Decides Type

A man who is a recognized authority on the potential demand for tractors and other motorized farm equipment says both types are adaptable to both corn and cotton planting and cultivation, while for the other 2-horse work about the farm, such as handling the hay harvest, manure spreading and similar tasks, while the 2-row type may be used, the small tractor type is preferable.

This looks like an eminently safe answer at any rate in the present stage of motor cultivator development. But, however that may be, it cannot affect the fact that a potential demand of tremendous proportions exists for the motor cultivator, and the tractor dealer doing business in any section of the country in which row crops abound, particularly crops of corn and cotton, cannot afford to ignore it.

Facts Which Will Aid Truck Sales

They Are Valuable Statistics—Use Them

Replies to Government Questionnaire Show That Farmers Have Confidence in Trucks and That They Regard Them as Profitable Investments—Majority of Owners Prefer 1-Ton Size and Pneumatic Tires—Poor Roads Retarding Factor in Use.

THE conclusions reached in a study of the questionnaires received from 831 representative corn-belt farmers by the Division of Rural Engineering of the Bureau of Public Roads and the Office of Farm Management and Farm Economics show an overwhelming majority of farmers in agreement that motor trucks are the most effective means of transportation, the greatest advantage being in time saving.

The outstanding feature developed by the inquiry was the confidence of the farmer in his motor truck. Ninety-one per cent were firmly convinced that the truck had demonstrated its worth sufficiently to warrant the assumption that it was a profitable investment. Seventy-eight per cent emphasized the labor saving feature through the reduction in the number of employees. It was found, for instance, that on farms where reductions were reported by operators the average saving amounted to $209 a year and there were numerous cases where the savings exceeded this figure.

Fifty Per Cent Own Tractors

It is significant to note that half of the farmers listed in the survey own tractors. As the territory covered by the investigation is the center of the nation's agricultural production the findings may be taken as illustrative of the general efficiency of the motor truck and tractor. More than three-fourths of the farmers were in accord as to the influences militating against increased use of motor trucks in agricultural districts. Without exception these truck owners condemned poor roads as the chief drawback.

The investigation was made during the past winter and spring. Farmer truck owners in Indiana, Illinois, Missouri, Iowa, southern Wisconsin, southern Minnesota, southeastern South Dakota, eastern Nebraska and eastern Kansas, who raise corn as one of the principal crops and who practice the general grain and livestock farming characteristic of the corn-belt reported the use they made of their trucks, the cost of operating them, the advantages and disadvantages of trucks for farm use and other related information.

Savings Result

On the average the trucks travel 2,777 miles a year and the cost of operation is between 16½ cents and 17 cents a mile, making the total annual cost from $460 to $470. Each truck displaces an average of one-half head of work stock. With the cost of keeping a horse a year in the corn-belt around $200 the reduction in expense for this item is in the neighborhood of $240 a farm. For all farms the average amount of hired help saved by the trucks is $163. On most farms these are the only two items of direct reduction in expense which can be credited to

the truck, and on the average they amount to $60 or $70 less than the total cost of operating it.

To offset this added cost, custom hauling done with the trucks amounts to about $50 a year for all farms, leaving only something like $10 to $20 annual net expense which must be more than balanced by the saving of time of the owner and members of the family, the ability to get crops and live stock to market in better condition or at better time, and other benefits which are not directly measurable in dollars and cents, if the average truck is to be a profitable investment.

Most of the farms where trucks are owned are larger than the average and are located at a considerable distance from market.

Some of the important facts revealed by the investigation are:

The average size of the farms is 346 acres and their average distance from market eight miles.

Only 14 per cent of them are less than five miles and 20 per cent are fifteen miles or more from market.

Enlarge Market Possibilities

A little more than one-fourth of the farmers have changed their markets for at least a part of their produce since purchasing trucks. For those who have changed market the average distance to the old market was seven miles and to the new market is eighteen miles.

The rated capacity of the trucks varies from one-half to two tons. Seventy per cent of them are rated at one ton and only 9 per cent of them at less than one ton.

Experience with trucks has caused 57 per cent of the farmers to decide that the 1-ton size is best for their conditions, 25 per cent that the 1½ ton size is best and 12 per cent that the 2-ton is best. Practically one man in four has decided that a truck larger than the one he now owns would be better suited to his conditions.

As compared with horses and wagons the trucks save about two-thirds of the time required for hauling to and from these farms.

On the average there are over eight weeks during the year when the roads are in such condition on account of mud, snow, etc., that these trucks cannot be used. The roads on which nearly 95 per cent of them usually travel are all or part dirt. The condition of the roads prevented the use of the trucks with pneumatic tires a little less than seven weeks during the year covered by the reports, and of those with solid tires a little over nine weeks.

The Tires They Use

Twenty-four per cent of the trucks are equipped with pneumatic tires, 27 per cent with solid tires, and 49 per cent with pneumatics in front and solids in rear. However, experience has convinced 58 per cent that pneumatics are best for their conditions, 35 per cent that solids are best, and 7 per cent that pneumatics in front and solids in rear are best.

The farm owners have return loads for their trucks about one-third of the time.

A majority of these men still use their horses for some hauling on the road.

On more than half of the farms all the hauling in the fields and around the buildings is still done with horses and wagons.

About 40 per cent of the farmers did some custom hauling with their trucks during the year covered by the reports. The average amount received by those who did such work was $132.

Their owners estimate that on the average the trucks are used on 112 days per year.

The average estimated life of the trucks is 6½ years, and on this basis depreciation is usually the largest single item of expense in connection with their operation.

AFTER an authoritative investigation the Department of Agriculture has advanced undisputed evidence of the beneficial results of motor trucks.

It has determined from the views of farmer-owners that motor trucks are

Saving time.

Solving the labor problem.

Moving crops and live stock to market more quickly and delivering them there in better condition than under old methods of transportation.

These and other facts which will help the dealer in trucks are brought out in the Department survey.

The average cost of operation, including depreciation, interest on investment, repairs, registration and license fees, fuel, oil and tires, is 15.2 cents per mile for the ½ and ¾-ton trucks, 15.2 for the 1-ton, 21.3 cents for the 1¼ and 1½-ton, and 25.8 cents for the 2-ton.

The average cost of hauling crops, including the value of the driver's time of 50 cents per hour, is 24 cents per ton-mile with the ½ and ¾-ton trucks, 24.1 cents with the 1-ton, 23.3 cents with the 1¼ and 1½-ton, and 21.5 cents with the 2-ton trucks.

Work Every Day

Nearly 85 per cent of the trucks covered by the reports had not been out of commission when needed for a single day during the year, and 80 per cent of the owners stated that they had not lost any appreciable time on account of motor and tire trouble, breakage, etc., when using their trucks. About one truck in fifteen was out of commission more than five days, however, and one owner in forty reported a loss of more than 5 per cent of the time when using his truck.

Fifty-six per cent of the owners have not reduced the number of their work stock since purchasing trucks. Twenty-four per cent have disposed of one or two head, and 20 per cent of more than two head. The average reduction for all farms is 1.2 head.

Most of the tractors are owned on the larger farms. Only 33 per cent of the men whose farms contain 160 crop acres or less own tractors, while 65 per cent of those with over 320 crop acres own them. The number of work stock kept on the farms where both trucks and tractors are owned is only slightly less than the number kept on the farms of corresponding size where only trucks are owned.

NEW FILLER INSTEAD OF AIR

Saginaw, Mich., Oct. 1—The Aero Cushion Inner Tire and Rubber Co. has purchased the old Banner Brewery Co. plant in this city and will install machinery for the manufacture of a substitute for air in pneumatic tires. The company manufactures a filler out of pure rubber which is treated by a process that fills it with minute air spaces and it is claimed the filler is equal if not superior in resiliency. It also is claimed to overcome all the defects in other fillers. The company has three plants now in operation in Canada, Ogden, Utah and San Jose, Calif.

ANOTHER PLANT FOR FLINT

Flint, Mich., Oct. 1.—The Flint Board of Commerce is negotiating with F. A. Crandell for the establishment of a plant for building an all-purpose farm body. Mr. Crandell is said to have contracts with Republic Truck Co. and others insuring a demand for an output of 200 bodies a day.

BAD ROADS THREATEN INDUSTRY

Flint, Mich., Oct. 1—Industrial leaders and business men of Flint at a meeting here this week voiced vigorous protest against road conditions in the country, which practically have isolated this city. It was declared in the meeting that Flint factories, particularly automobile plants, might have to shut down because of the inability to move cars, automobiles and trucks, to and from the factories on account of the bad roads. It was declared the near approach of winter made it almost impossible to get roads in condition for transport before bad weather sets in preventing further efforts at road construction. State and country road officials were called upon to act immediately in the effort to relieve conditions which threatened the loss of millions and the unemployment of thousands of workingmen.

TRAILER EMPLOYEES GET BONUS

Detroit, Oct. 4—Employees of the Fruehauf Trailer Co. have been presented with the quarterly bonus by company officials at a banquet at Westwood Inn the bonus being the largest yet distributed by the company. This, too, in face of the fact, according to A. C. Fruehauf, that the organization practically has been doubled in the last six monhts. Salesmanagers from the western, southern and New England districts were present at the banquet and told of conditions in the respective sections, which they said were rapidly emerging from a period of depression with prospects for a steady return to normal.

EDITORIAL

THE EXCHANGE OF IDEAS

CONVENTIONS of sales managers and meetings of salesmen are all a part of the movement to promote the efficiency of the men who direct the selling of cars and of those who are in direct touch with the consumer. Such gatherings have always been of undisputed value and they assume a much more important phase today.

The ability of the salesman to ferret out a customer is one thing and his ability to prove convincing in order to consummate a purchase is another. New problems are confronting the salesman every day; they should not be allowed to accumulate. If they are it will only result in confusion in their minds.

Conventions and meetings are primarily for the purpose of receiving and imparting knowledge; their secondary purpose, which cannot be regarded as less valuable, is the exchange of ideas. The more the men get together, whether at the factory, in the rooms of the disributor or at the dealer's salesrooms, the greater will their efficiency be; their value to themselves will be improved immeasurably and so their worth to the organization whose interests they have at heart.

A fine spirit of co-operation among all the forces of an organization is a vitalizing influence. Get the men together, talk things over with them, encourage the exchange of views. Efficiency is the keynote to success.

PRACTICAL SERVICE POLICY

PERSONAL contact with the customers is essential, but there must be a limiting factor. Too much contact results in requests for preference, better prices, etc., and if great care is not taken dissatisfaction will result. When rendering service to be prompt.

If the car is promised for a certain time and it is found impossible to turn the job out as promised, notify the owner and get permission to continue or at least make some satisfactory arrangements. In most cases it is entirely satisfactory to the owner, but if he is not notified and the car is not ready at the designated time there will naturally be friction.

Often times when working on a car it will be found necessary to do work that the owner knows nothing about. If the work is done without his permission and a large repair bill is sent, he will be angered. The policy should be, always get in touch with the owner whenever conditions demand.

For cars operating the year around, the winter service continues as it does in the summer, but for cars not in operation during the winter it will be necessary to go after the overhauling business. Call in the owner and go over the required repair operation. Outline in detail what ought to be done and give the approximate cost. Then carry out his ideas and do just what he wants done.

Better satisfaction results where it is possible to conduct service only on the cars sold by the organization. Where small service jobs are to be done take in any car, but where it is necessary to do a large overhauling job, turn the car over to the service station doing work on the particular make of car.

Personal contact with the car owner is one of the best methods of education. The moulding of the owner's mind with regard to the care and operation is entirely in the hands of the service man.

100% SATISFACTION AND OTHER THINGS

SERVICE is the one big factor that controls the volume of sales. Placing a piece of machinery in the field without a system of distribution that will make immediate service possible is the next thing to spelling failure. At present this is particularly true of the tractor industry. Many people are still skeptical and insist upon being shown.

Farm work cannot be put off from day to day but must be carried on according to conditions. If the farmer has purchased a tractor and sold his horses he is entirely dependent upon the tractor for his existence. Should the tractor be allowed to stand idle it will not only mean a dissatisfied owner but will have a decidedly strong psychological effect in the entire community. Those seeing the tractor idle will become skeptical and it will be very difficult to sell them under these conditions.

In servicing the tractor it is necessary to carry the service to the tractor and not the tractor to the sevice. You must be supplied with parts and be able to keep every machine in operation all the time. If you find that a man is sold one hundred per cent on a product that you are not handling, don't talk him out of it, as it will result in dissatisfaction in nine cases out of ten.

Study conditions and choose a product that is adapted to your territory as it will minimize your calls for service. Keep in contact with the owners and find out if they are satisfied with your service. Keep your man 100% sold by backing up your sales with 100% service.

SANITATION IS GOOD BUSINESS

RECENTLY on a tour through a factory it was noticed how spotlessly clean the building was. Every attempt had been made to provide every convenience that would make the men comfortable. One particularly noticeable feature was the manner in which every corner of the building, every staircase turn, every doorway, pillar and post base, was painted white. The intention of these dabs of white paint was of course to remove the temptation arising from the use of the plug of tobacco. Every dark corner presents a convenient possibility to let-'er-fly, which is removed once the corner is liberally treated with white paint. A clean building invites business.

Establishing Good Relations With Dealers Through Service

Distributor in Blocking Off Territory Arranges for Traveling Team of Mechanics

KANSAS CITY, MO., Oct. 2—Distributor interest in dealers' prospects and sales is the leading factor in distributors' success according to officials of the Hathaway Motor Co., western Missouri and Kansas distributors of Velie passenger cars and trucks. In selling over 100 trucks each month the Hathaway company keeps in close touch with the sales and service of many hundred dealers throughout its territory.

A traveling service team of four expert mechanics calls every six weeks on Velie dealers, requiring Velie car and truck owners to bring in their machines for overhaul. The territory is blocked off into about fifteen counties, varying with the extent of business, forming a comunit. This block is under the direction and supervision of service experts who see that every car and truck is giving perfect satisfaction to its owner. The rural dealer advertises in his local paper requiring that all cars be brought in to his station for service and the work is accomplished under the direction of the Hathaway traveling mechanics.

The intimate relation of distributor and dealer is carried out by this company by assigning a salesman to a block of territory similar to the territory covered by the traveling mechanics. Over this district the salesman is constantly working, assisting dealers to secure prospects, close sales and finance time sales. The salesman is personally acquainted with the prospects of the country dealer and is of material assistance in making sales. If the country dealer is having difficulty in securing credit from his local banker the Hathaway salesman in company with the dealer calls upon the banker in an effort to secure for the dealer a longer line of credit.

A list of prospects is furnished the Hathaway company by its dealers and a mail advertising campaign is carried on from Kansas City, assisting the dealer to make the sale. A book of fifty hours free service is given every new Velie owner who pays in coupons for the work on his car.

FORM ANOTHER FINANCE COMPANY

Wilkesbarre, Pa., Oct. 2—To finance the purchase and sale of motor vehicles on the time payment plan, the General Guarantee Co. of this city has been organized with $2,000,000 capital stock. Local men are officials of the company, with John R. Wilson, president, and A. W. Guy, secretary.

AGAINST BATTERY DEFACEMENT

Cleveland, Oct. 5—The board of trustees of the Cleveland Automotive Association have approved the tentative draft of a bill concerning the wilful defacement of rental storage batteries. This bill was prepared by the electrical division of the association and forwarded to the board of trustees with the request that an attempt be made to have the same placed on the statute books of Ohio as soon as possible after the general assembly convened. The trustees, therefore, submitted the bill to the Ohio Automotive Trade Association, Columbus, requesting that that organization use its influence to get the bill before the legislature and passed.

Maybe There Is a Prospect Like This in Your City

ATLANTA, Ga., Sept. 24.—What is believed to have been the largest single retail sale of automobiles ever made in Atlanta, has just been announced by E. R. Parker, of the E. R. Parker Motor Co., wholesale and retail distributors of Chandler and Cleveland automobiles in the state of Georgia. The sale was made to the Georgia School of Technology, of Atlanta, and consisted of a fleet of nine Chandler automobiles that will be used by the institution in a statewide drive for funds for the development of a "Greater Georgia Tech."

When the cars were recently called for, delivery of the entire nine was made by the company within two days. The Chandler trade mark is painted on each car together with the name of the E. R. Parker Motor Co. On each car is also lettered in gold, "Georgia Tech Produces Producers," and the slogan of the institution, "A Greater Georgia Tech for a Greater Industrial Georgia."

Adopts Shelf Cleaning Plan in Effecting Sales of Used Cars

Philadelphia, Oct. 2—In its used-car department, the Overland-Harper Co. is trying a novel shelf-cleaning plan. Twenty per cent reduction is being offered in motor cars that the company has traded in for new Overlands. Every car was tested before acceptance here, rebuilt in the local shops and backed by the company's warrant.

Each car is tagged with the sale price, from which the 20 per cent is deducted. That is, $360 will buy a car marked $450. The option is given of paying cash or buying the cars on time. A sum as low as $75 will buy a car, with the balance on time in monthly payments. Among the cars are Packard sizes, Fords, Chevrolets, Studebakers, Paiges, and a dozen other well known makes. Most of the cars, however, are Overlands.

The customer is allowed to select the car and drive it a week, with the privilege of returning it if it is not as represented. The sale is bringing good results.

Three Michigan Parts Makers Announce Reductions in Prices

Others Say Cuts Not Possible In View of Labor and Material Costs

DETROIT, Oct. 5—The Continental Motors Corp. to-day announced a reduction of 5 per cent in their product.

C. D. McKim, sales manager says: "We are not announcing this reduction because the profit justifies it but simply to aid the downward movement that is sweeping over the country. Parts makers are like every other industry. Prices are controlled by labor and material costs. There has been no reduction there and consequently the company is simply acting in the interest of helping bring down excessive prices in all commodities."

C. W. Dickerson, secretary-treasurer of the Timken Detroit Axle Co., announces a reduction of 7 per cent.

"We are making the reduction," he says, "because we feel it our duty to aid the movement downward."

M. R. Fuller of the Fuller Transmission Co., Kalamazoo, Mich., states that a 4 per cent cut on the L. T. U. model has been decided upon.

"We do it," he says, "because we can make the new model in greater quantities than the old and this justifies the reduction."

T. I. Shobe, general manager, Zenith Carbureter Co., Detroit, says:

"No reduction can be made in our prices with labor at the present prices."

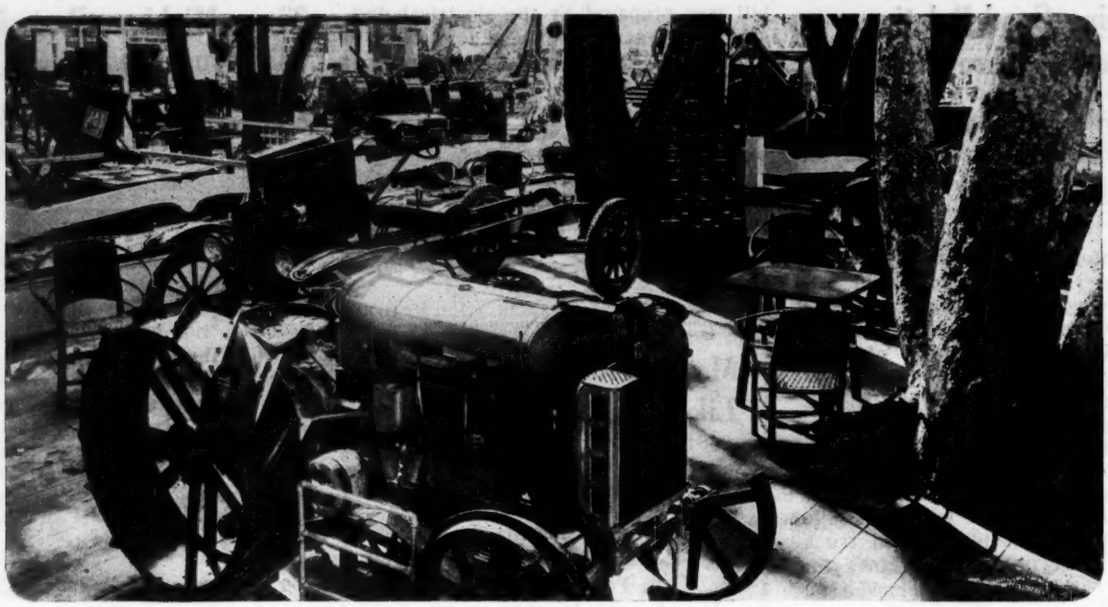
H. L. Lord, sales manager, Detroit Lubricator Co., states that a reduction in price in their products is impossible as labor is the first factor and there is no prospect in the reduction of labor cost.

The Detroit Gear & Machine Co. states that there is nothing in the situation to justify a reduction in its products. It says:

"The automobile manufacturers are trying to get the parts makers to carry the load. The parts makers bought at high prices to fill contracts with automobile manufacturers and they have this high priced material on hand. They cannot sell it at a reduced price.

CARDS USED TO TRACE THIEVES

Boston, Oct. 1—Telling automobile thieves by cards is proving decidedly successful. When an automobile is registered in Massachusetts, a white card is filed bearing a full description of the machine, the engine number, maker's number and other identifying details. Whenever a car is reported stolen anywhere in the country a blue card is made out with the same information and filed in the same index, the filing being done with reference to the serial numbers. Whenever a white card is found to coincide with the blue card there is trouble ahead for some one, in most instances.



Section of National Tractor Show of the West, held near Los Angeles, showing the Ford Motor Co. exhibit in the foreground. This company had a crew of mechanical experts and a large sales force on hand and reported big returns

Which Produces the Most Business—

The "Still" Tractor Exhibit or the Demonstrating Show?

The National Tractor Show for the West a "Still" Exhibit, But Displays of Parts and Lectures Keep Visitors Interested

FROM the standpoint of affording dealers opportunity to inspect accessibility and mechanical construction so as to become better acquainted with the probabilities of service requirements the National Tractor Show for the West held the week of September 20-26 near Los Angeles was the best ever held in that part of the country. A number of the exhibits incorporated skeleton tractors with all working parts exposed and in actual operation. There was a general display of the various parts of tractors.

A number of the exhibitors had in constant attendance skilled lecturers or well-educated salesmen who could talk understandingly, and mechanics was in every instance the chief theme. Displays which featured this always were surrounded by eager and interested listeners, again proving that *everybody is interested in what makes the wheels go 'round.*

THERE was no indication of any tractor manufacturer or distributor taking advantage of the attendance of dealers to conduct a service school. If tractor factories ever woke up to the opportunity in connection with shows to follow the example of motor car producers by having expert mechanics conduct a question and answer school open to all concerned they could accomplish a great deal more than ever has been apparent at tractor shows held in the vicinity of Los Angeles. They may do this some day but in the meantime there is going to waste a valuable opportunity.

This was a "still" tractor show but it was evident opening day that something would have to be done to stimulate the interest of the crowd. This was accomplished during the remainder of the show by operating the engines, removing the tracks of track-layer types and running the tractors back and forth over these. There were no field demonstrations and no opportunity was afforded for actual performance. The rules prevented demonstrations. Prof. Fletcher, of the agriculture department of the University of California said that the demonstrations have served their day, farmers and dealers are tractor-wise now and they can tell more from specifications of a tractor about how well it will work than they can by following it around a dusty field. For the show visitors it can be said truthfully that they enjoyed the freedom from dust that is so characteristic of all demonstrating shows.

Dealers Main Object of Show

This show was said to be conducted for the purpose of interesting dealers in tractors more than in the interest of consumers. A wide variance of opinion was expressed among the exhibitors, some holding that a demonstrating show is a greater stimulant for business as it creates more interest among consumers and when the consumers are aroused to the need for tractors and the demand has been brought about it is a simple matter to get the dealers.

Dealers attended from all the Pacific Coast states, but, with the exception of California, in limited number. There were a few from Nevada and Arizona and one delegation from Pocatello, Idaho, but practically no others from east of the Sierras. Consumers came only from the immediate vicinity of Los Angeles. They are too accustomed to local tractor shows to go to any expense and inconvenience to do otherwise. They can see tractors at their local county fairs or in their home towns so there was no real urgency for them coming to a so-called national show.

The show did prove to be a business getter. On this point all exhibitors agreed although some held out that more business is done at demonstrating events. There was not enough interest among the manufacturers in this show. Several of the factories were represented by a single man while others were without representation. In many instances the factories put the show responsibility wholly up to their distributors. Some stood half the expense and others did not share any of it.

The Ford Motor Co. was a brilliant con-

trast. They turned loose with about everything they had. A crew of mechanical experts and a complete sales force was on hand. This was the first show in which the company has participated as a factory and the representatives all said it was a big paying proposition to them. The Ford display was placed on a special platform. Ford dealers were brought in from all parts of the state by the W. L. Hughson Co., the distributors, who had an independent display. The announcement concerning a price reduction was made while the show was in progress and was cashed in on to the fullest extent. Some exhibitors had nothing in the way of a supply of literature and the interested prospect was asked to sign his name so that literature could be sent later.

Much Territory Allotted

The show also succeeded in interesting dealers and many contracts for territory were signed. As usual the best known lines were the most successful in this respect. Their business methods no doubt are the correct answer. *They went out after the dealers and got them while the less enterprising wondered how they got away with it.* It was very evident at this show that real work is ahead of the tractor people.

There was a noticeable absence at the show of automobile dealers who were looking for tractor lines. It looks as if a new field of endeavor will be created in the power equipment merchandiser who will handle a line of tractors, implements adapted for tractor use and a farm light outfit, although the general distribution of electric current in this part of the country will make the latter somewhat of a restricted field.

There were few new makes of tractors or improved models of old lines shown. The Yuba had a smaller model on display with chairback seat, an improvement that elicited widespread comment. It is evident that at last one tractor manufacturer has given some thought to the comfort of the driver.

Presented an Attractive Setting

This was a very pretty show. The scenic setting was ideal for an open air event. There was liberal use of decorations, green and white having been adopted for the color scheme. Many of the exhibits were immaculate in white enamel with gold striping. There were all sorts of plows and other implements. Paint and nickel plating will go a long ways toward making the commonplace plow attractive at show time. The forty tractors offered sufficient variety as they ranged from the mammoth Avery 40-80 to the tiny Beeman and Oldsmar. There was almost every conceivable sort of accessory and power device, even a mechanical milker. Some exhibitors made good use of a motion picture machine and screen to display their tractors in field performance.

BLUEFIELD DEALERS ORGANIZE

Bluefield, W. Va., Oct. 1—The Automobile Dealers' Association of Bluefield has been organized here with the election of the following officers: J. F. Salisbury, president; Bowen Greever, vice president; J. F. Willis, secretary and treasurer, who, with W. L. Mustard and J. P. Royal, will constitute the board of directors. Practically every dealer in the city is a member of the organization and efforts will be made to bring in the dealers in Mercer, McDowell and Tazewell counties.

The Tractor Dealer Must Sell Complete Power Farming Equipment

Equipment display at National Tractor Show of the West held near Los Angeles. To accomplish any degree of success the dealer selling tractors must also sell power farming equipment, and unless he does he cannot hope to build a permanent tractor business

Indiana Jobbers Take Steps to Form State Organization

Subsequent Meeting Will Be Held to Adopt Constitution, Select Officers and Name

INDIANAPOLIS, Oct. 1—First steps toward organizing the automotive equipment jobbers of the state were taken at a meeting of the Indiana members of the Automotive Equipment Association held here Sept. 23. George Fritz, national field secretary of the association, acted as chairman. The new organization will maintain a connection with the national association only insofar as its members may also be members of the larger body. It is not a branch of the equipment association although formed under its auspices.

Organization Long Wanted

For several years there has been more or less of a movement among the jobbers to have such an organization as is now being formed. The matter was in the hands of W. R. Wheeler of the W. R. Wheeler Co. but upon his death and until the question was taken up by C. J. Lomont, president of Lomont & Co., Fort Wayne, who is also the state vice president of the equipment association, nothing was done.

At the meeting last month every Indiana member affiliated with the national association was present. A constitution and by-laws was framed which will be sent to the present members of the organization and to all other jobbers of automotive equipment in the state who have been invited to attend a meeting at the Claypool hotel Oct. 19. The election of officers also has been deferred until that time though it is very likely that Mr. Lomont because of his activities in the preliminary steps will be chosen president. At the same time the selection of a name for the organization will be acted upon. The name proposed is the Automotive Equipment Jobbers Association of Indiana.

In inviting all jobbers of the state dealing in automotive equipment into the organization it is aimed to get away from the clique idea and stimulate interest generally in the matters of value to the organization.

MAKING TRUCK REGULATIONS

Sacramento, Calif., Oct. 1—Following a conference with representatives of the large truck and tire companies of the Pacific coast, Charles J. Chenu, superintendent of the California Motor Vehicle Department, authorized the appointment of a committee to draw up a schedule of speed and weights to be allowed trucks on the state highways. Robert M. Martland, secretary of the State Automobile Trade Association, will name the committee. Upon the report of this committee another conference will be called and Mr. Chenu then will go before the Legislature when it meets in January and ask for a law to make these regulations effective.

Concerning Men You Know

Harry Genug, president of the Kansas City Motor Dealers' Association, has sold his interests in the South West Day Elder Co. to H. A. Dougherty, president of the H. A. Dougherty Motor Co., and has purchased Mr. Dougherty's interests in the D and D Co.

Samuel B. Robertson, for twenty years manager of the vehicle branch of the Studebaker Corp. in Kansas City has organized the Robertson Motor Co. to distribute Graham trucks.

W. E. Hutchison, manager of purchases for the Southern Motor Mfg. Association, Ltd., Houston, Texas, has opened a permanent office for the association in Detroit, the temporary location of which is 521 Book building. He will remain in charge of the office which is to handle such part of the assocation's purchases as can be made to better advantage there until it is well established. A. A. Franck, who has been comptroller for the association has been promoted to assistant treasurer.

Arthur Brisse who has been engaged in the automotive repair business in Madison, Wis., for fifteen years has purchased the service department and repair shop of the Smart Auto Co., Madison. He will handle the service requirements of the Smart company.

D. A. Burdick, for twelve years in the automobile business in Boston, has returned to the city as sales manager for Frederick J. Caldwell, Inc., agent for Templar and Sunbeam cars.

Clarence E. Eldridge, formerly assistant manager of the Reo Motor Car Co. of Chicago and now vice president and general manager, announces the resignation of J. J. Lake as retail sales manager and the appointment of N. O. Gilbert to succeed him.

W. D. Edenburn, tour manager for the Michigan Pikes Association, is heading a pathfinding party on an 800 mile exploration drive through northern Michigan and Canada, preparing a report from which the 1921 tour will be routed.

Fred P. Scribner, for many years superintendent of the Raybestos plant in Bridgeport and for the last eleven, superintendent of the F. L. Morton Co. of Boston, has become superintendent of the Staybestos Mfg. Co. of Philadelphia in which he has taken an interest.

D. A. Goodkind has resigned as sales manager of the Lucia Mfg. Co., Inc. The sales office of the company has been removed from New York City to the factory at Hartford, Conn.

H. J. Volger, who has been connected with the industry for eleven years, has resigned as general sales manager of the American Motor Truck Co., with which he has been associated for the last fifteen months in organizing sales, service and advertising of Ace trucks. He was previously eastern manager for Maxwell Motor Co., Inc., and wholesale manager for Willys-Overland with headquarters in New York.

H. H. Brown, formerly with the Four Wheel Drive Auto Co., has been named sales manager of the Hamilton Motors Co., in charge of western Missouri, Illinois, Indiana, Ohio and Kentucky with headquarters at Chicago; Walter A. Murphy, of the same connection, sales manager in charge of Michigan, Wisconsin, Minnesota, Iowa, North and South Dakota, Kansas and Western Missouri with headquarters at Chicago; L. R. Hunter, North and South Carolina, Georgia, Florida, Alabama and Mississippi with headquarters at Atlanta.

Belden H. Blake has been appointed general manager of the Pellet Magneto Co., Chicago. Mr. Blake has had a thorough training in automobile accessory distribution and has fourteen years' experience in electrical engineering.

John T. Milar, formerly connected with the National Highway Industries at Washington, D. C., has been selected manager of the Columbus Automotive Trade Association to fill the vacancy caused by the resignation of S. C. Magruder.

Southern Farmer Is Learning More of Tractor Adaptability

New Orleans, La., Oct. 4—Tractor dealers, now preparing for heavy sales during the Spring rice, cane and corn planting, have had the best season for sales they ever have had in Louisiana and Mississippi, according to the virtually unanimous opinion of all these dealers in New Orleans.

The practical farmers have learned this year as never before how great an aid the tractor is to farming; they have found that there is a tractor for every purpose; they are beginning to give the tractor proposition, when it is put up to them, the most serious consideration and the result is that where one tractor was sold out of New Orleans last year, ten to fifteen were sold this year.

Besides regular farm work, a number of the smaller towns and cities of the two states are using tractors for street and road building and repair. Only within the past year or so has it been possible for the cane planters to obtain a tractor which would work their cane through planting, cultivation, harvesting and transportation to plantation mills, but they can now get these adaptable tractors, and their use is increasing rapidly. The Louisiana planters have demonstrated that fifteen to sixteen acres a day is the best limit for the tractor, though as high as twenty-one acres have been cultivated.

A law passed by the last Louisiana legislature compels all tractor dealers in the state to carry a complete line of parts and equipment for the makes of tractors they sell. This has put several small dealers out of business in rural communities, through lack of capital.

ARKANSAS FAVORS CLOSED CARS

Little Rock, Ark., Oct. 1—Efforts to include new models of open cars in the closed car show have proven unavailing and the show committee of the Little Rock Automobile Dealers' Association has definitely decided that only closed cars may be displayed. The show will be held Oct. 4 to 8.

"The people of the South have considered it largely a bad weather car and not necessary in this country," a local dealer said. "This is not true, for the closed car can be made comfortable in any climate and under all conditions."

USED CARS AUCTIONED

Atlanta, Ga., Sept. 17—What is believed to have been the largest auction sale of rebuilt automobiles conducted in the Southeast has been held at the display rooms of the J. W. Goldsmith, Jr., Grant Co., Atlanta. Every car sold was guaranteed by this company completely overhauled and repaired in their own shops and the cars were invariably sold to the highest bidder. Terms to buyers outside of Atlanta were cash, but sales to Atlanta people, or in Fulton or De Kalb counties, were made on time.

Thirty-two automobiles were listed in the sale, mainly Hudson and Essex cars. To advertise the sale an eight page booklet was issued, 6 by 9 in., in which each of the thirty-two cars was fully described. These were distributed all over the state.

MOLINE PLOW TO BUILD TRUCKS

Moline, Ill., Sept. 24—The Moline Plow Co., manufacturing farm implements and tractors for many years, will market a line of commercial vehicles after October 1. Experiments and development work have been going on for some time and the experimental models have completed exhaustive test runs. The first model to be distributed will be Model 10, having a capacity of 1½ tons. The same engine is used in this model as in the Moline Universal tractor. The trucks will be distributed through Moline implement and tractor dealers. Many of the parts of the tractor and the truck are interchangeable.

Kansas City Dealers to Hear E. S. Jordan on Conditions

Kansas City, Mo., Oct. 1—A rally which will bring automotive dealers from all the principal cities and towns of Kansas City's trade territory has been planned by the Kansas City Motor Car Dealers' Association for Oct. 14. The principal speakers will be Edward S. Jordan, president of the Jordan Motor Car Co., Cleveland, Ohio. A luncheon will be held at the Hotel Baltimore when Mr. Jordan will discuss conditions confronting the passenger car dealer and the prospects for the industry this fall and winter. Over 500 dealers are expected from out of the city to attend the meeting according to E. E. Peake, secretary of the Kansas City Motor Car Dealers' Association.

TIRE DEALERS TO ORGANIZE

Chicago, Oct. 1—The organizing of tire dealers and vulcanizing shop owners in this city and adjacent towns is under consideration and the movement will take definite shape at a meeting to be held in this city the early part of this month. It was originally planned that only dealers and shop owners in Chicago be included in the membership but it is expected that those in the vicinity will be invited. At one meeting already held fifty tire dealers in the city were present.

REPUBLIC DEALERS MEET

Alma, Mich., Oct. 1—Improvement in sales is expected by the Republic Sales Truck Corp. as a result of a distributors' convention held at the factory Sept. 13 and 14. The distributors looked over the plant and the product and were addressed by Walter P. Chrysler and other officials.

Weather Turns Cold as Dealers Hold First Closed Car Display

Ninety Cars Representing Every Model for Sale in Northwest at Minneapolis Show

MINNEAPOLIS, Oct. 1—This city's first closed car show, held under the auspices of the Minneapolis Auto Trades Association, opened at the National Guard Armory last night with speeches by Edward S. Jordan, president of the Jordan Motor Co., and Mayor J. E. Meyers. Ninety cars representing virtually every type of closed automobile offered for sale in the Northwest were on the floor. The show will continue during the remainder of the week.

A sudden turn to cold weather kept down the attendance though exhibitors found a certain solace in the fact that it was distinctly "closed car" weather and felt that this would react to their benefit. The open air dancing, a feature planned by Manager Walter Wilmot, was abandoned because of the weather.

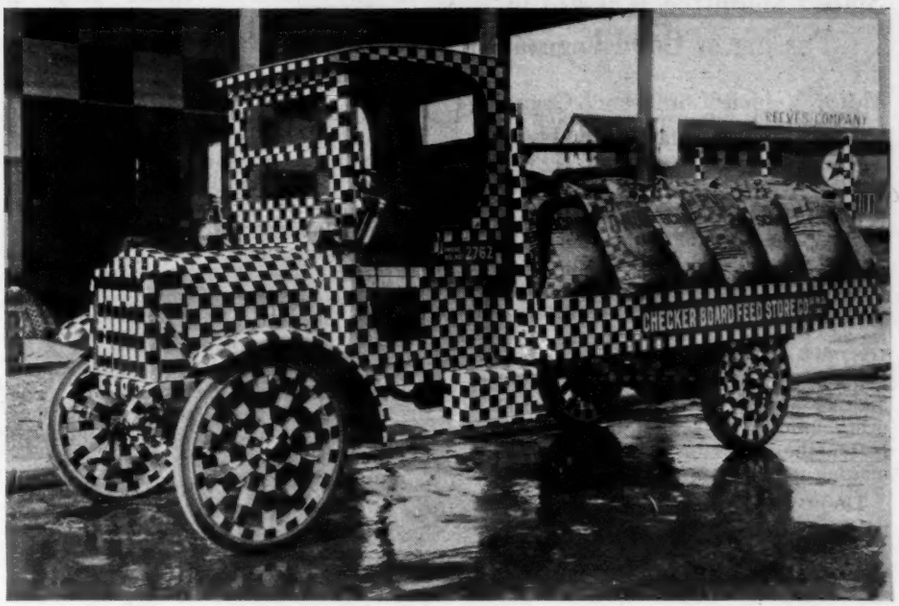
Though originally launched as a purely local affair, the co-operation of St. Paul agencies with Minneapolis dealers expanded the show to be one for virtually the entire Northwest territory for which Minneapolis is the distributing center. This is the first venture of this magnitude by the Minneapolis Auto Trades Association but the increasing popularity and appreciation of the advantages of the closed car for this climate and the enthusiastic co-operation of the dealers insures the exhibition as an annual event. No accessories and no cars not coming within the strict definition of closed cars are shown.

MORE CHANGES FOR BRISCOE

Jackson, Mich., Oct. 1—L. L. Wilburn, a veteran in the automobile industry, has been made general superintendent in charge of production by the Briscoe Motor Corp. The appointment of Mr. Wilburn is another step in President Wardwell's determination to build an organization that will insure Briscoe production to keep pace with demand. Another move by Mr. Wardwell to increase efficiency at the plant is the appointment of A. H. Hanneman, formerly in charge of closed body construction for Oakland Motor Car Co. and other General Motors Units, as general superintendent of the Bohnet Body Co. at Lansing, Mich. The Bohnet company is a subsidiary of Briscoe.

FOLGER CAROLINA'S HEAD

Charlotte, N. C., Oct. 2—The annual convention of the Carolinas Automotive Trade Association was held here a few days ago. Lee A. Folger was re-elected president. Other officers chosen were: John E. Sadler, Anderson, S. C., first vice president; W. H. McGlamery, Greensboro, second vice president; W. T. Hoppe, Charlotte, treasurer; directors, J. G. Fitzsimmons, Charlotte; D. P. Sloan, Anderson, S. C.; Lindsay Fishel, Winston, Salem; H. S. Dowling, Charlotte; U. B. Blalock, Wadesboro; N. A. Riddick, Scotland Neck; E. C. Sawyer, Asheville; H. M. Weathers, Greensboro. Paul F. Brophy remains executive secretary by choice of the executive committee. This has been the most successful automotive meeting in the history of the state.



A Good Selling Idea for Any Live Truck Dealer

Down in New Orleans there is a dealer in chicken feed, who believes in motor trucks. Not only does he believe in them for transportation, but for advertising. He paints every one of his fleet of four trucks a brilliant red and white, checkerboarded all over, and he says they are the best advertising he does, and he employs newspapers, magazines, billboards and motion-picture slides as well. "Everybody sees my trucks," says Mr. Simons, "and when they see them, the first thing they ask is, 'What for?' Then they see my business card on the truck, and they remember it; that is, they remember the weird, checkered truck, and every time they think of that truck, they think of Checkerboard Chicken Feed. I believe these trucks are the most profitable advertising I have, in addition to their economy of transportation

TIRE CHAIN STORES EXPAND

Cincinnati, O., Oct. 4—Chain stores operated by the Avon Tire & Rubber Co. here will be extended to other cities soon, it was announced here this week. Tire experts are making surveys in Chicago, Indianapolis, Boston and Pittsburgh with the intention of finding locations in some of those cities.

Would Have All Transactions in Used Cars Noted by Police

Rochester, Oct. 1—In a letter to the secretary of state of New York, Charles F. Buelte, president of Strong Motors, Inc., and Buelte Motors, Inc., Chandler and Cleveland distributors of central and western New York, urges that steps be taken by the state authorities to protect the innocent buyer and the legitimate merchandiser of passenger cars against the "underhand, more often known as the second-hand, dealer of stolen cars."

He says: "I would suggest that as the initial step, and an immediate one, the police department of every town and city be authorized to keep a register that must show every used car transaction."

Dealers Engage in Truck Tour to Help Good Roads Bond Issue

Will Talk Business on Way Showing Farmer How They Can Aid Him in His Work

KANSAS CITY, MO., Oct. 1—A truck tour in the interest of the $60,000,000 proposed good roads bond issue to be voted upon in Missouri in November, left here Sept. 27 on a thirty day tour of towns in northern Missouri. Royal J. Fredman, manager of the local branch of the Firestone ship-by-truck bureau, is acting as commander of the tour and has charge of all trucks and equipment. G. W. Catts, agricultural commissioner of the chamber of commerce is present in the capacity of speech maker in favor of the good roads bond issue.

With the ending of the northern branch of the tour at St. Louis, another detachment will leave that city immediately for a similar tour of southern Missouri towns. This second tour engaged in by dealers here this fall and its chief purpose besides familiarizing the farmer with the practicability of the truck will be to boost the state-wide bond issue.

Before its departure the Kansas City caravan paraded the business district accompanied by city and county officers and officials of the chamber of commerce and the Good Roads Association of greater Kansas City.

State Committee Will Aid in Passing of Good Legislation

Motor Vehicle Conference Organization Takes Action to Have Equitable Laws Enacted

NEW YORK, Oct. 1—Definite plans to care for motor vehicle legislation have been made at a meeting of the Motor Vehicle Conference Committee held at the N. A. C. C. headquarters with David Fenner as chairman and Harry Meixell as secretary. It is felt that more and more the industry must supply law making bodies with facts and figures of every kind so that they may understand better the needs of the industry in the making of laws.

The committee plans a strong campaign by advocating strict laws against speeders, drivers who use muffler cutouts or operate cars with run down tires that injure the roads. It meets weekly and expects this year to handle at least 3500 motor vehicle bills which are expected to be introduced in forty-two legislatures.

Motor Associations Gather Facts

During the current year the committee composed of representatives of the American Automobile Association, Motor & Accessory Manufacturers' Association, Rubber Association of America and Trailer Manufacturers' Association of America, has been gathering information relative to motor vehicle bills introduced and laws enacted and supplying it to its individual membership.

Next year it will not only follow the course of legislation but will endeavor to lay before the lawmakers facts and arguments which will tend to guide their efforts into channels which are both sound and equitable. With this in mind steps are now being taken to create in each state a sub-committee whose function it will be to unite all of the motor vehicle interests of that state for single and harmonious effort and to impress upon the legislatures the just and dealing with registration fees, size and committee believes should guide all motor vehicle legislation.

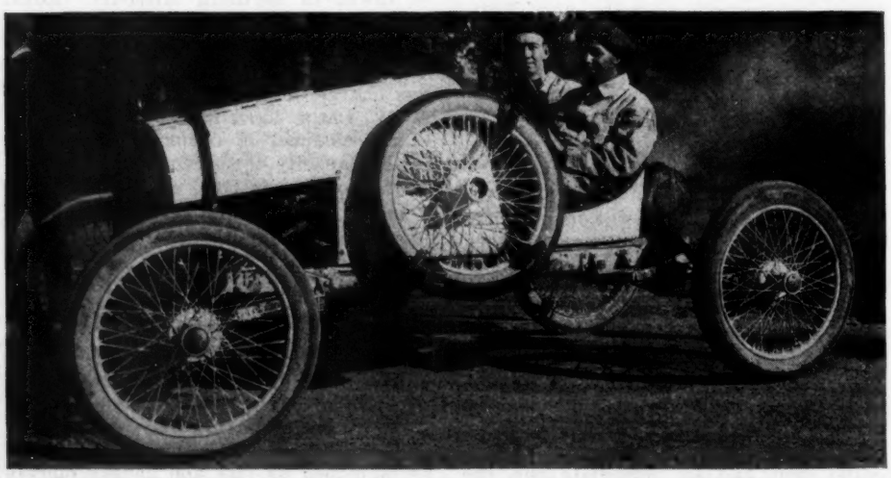
In creating these sub-committees each one of the six component associations of the Conference committee will appoint its own representatives in each state. These six appointees will then combine and form a working organization in constant and immediate contact and cooperation with the parent committee in New York, supplying it with information and obtaining most recent data relative to the success or failure, fairness or unfairness, etc., of the motor vehicle laws of other states.

The committee has already set forth in the proposed uniform vehicle law and uniform anti-theft law what it believes to be correct provisions for measures dealing with registration fees, size and weight restrictions, curbing of car stealing, etc., and is now engaged in formulating scientific guides to federal and state laws dealing with all other subjects of important concern to the motor vehicle. It will be the function of the various state sub-committees to have the motor vehicle interests of their respective states agree to accept and support these guides or policies and then unitedly to educate the public and the law makers to accept and support them.

Cash Prizes for Denver to Pueblo Race to Be Increased

Denver, Colo., Oct. 1—So successful was the 119-mile road race from Denver to Pueblo that $2,500 in cash prizes, more than four times the amount of this year's prizes, has already been provided for a repeat event next September. The race was staged on the opening day of the Colorado state fair at Pueblo and is likely to be made an annual classic.

Besides winning high praise from the drivers of the twenty cars that started and from dealers and motor racing enthusiasts in general, this year's event has enlisted several strong organizations in support of next year's event, among them being the Pueblo Automotive Trades Association, Pueblo Chamber of Commerce, Pueblo State Fair association and Pueblo Lions' club.



W. A. Coleman in the Chevrolet he drove to victory in the Denver-Pueblo road race of 119 miles in 2:09:40, and his mechanician, W. T. Day. Twenty cars started

Salesmen at Show Emphasize Service Car Owner May Expect

All Year Usefulness of Closed Car Pointed Out at Buffalo's Annual Motor Display

BUFFALO, Oct. 2—One notable feature of the second annual closed car show which was to end tonight was the emphasis placed on service by the salesmen. It has been the rule to point to the service a car owner may expect not only in his home town but in the touring district surrounding Buffalo. Salesmen have, of course, called attention of prospective buyers to the all year usefulness of closed cars but these arguments need no pressing for the most part. From them most successful salesmen at the show have turned to pledges of service and guarantees of performance as their clinching arguments.

Indications are that the exhibit will be accepted as one of the most successful from every standpoint held in an American city of Buffalo's size. Coming as it did at the time when price reductions were being announced it attracted hundreds of buyers as well as thousands of spectators. Fifty makes of cars were shown, all but two gasoline propelled. The others were electric. There was not an open car on display.

Plywood Frame Arouses Interest

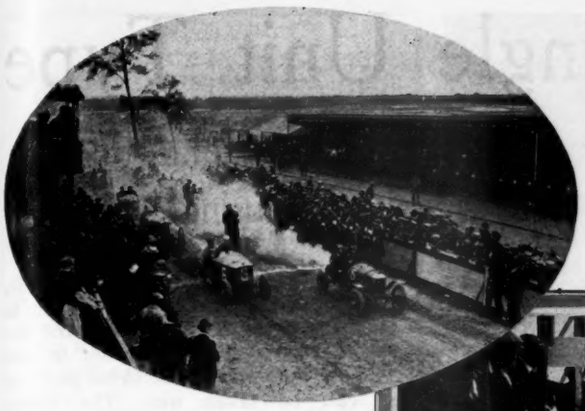
Much interest was shown in the new Lafayette and in the first Parenti closed car produced. The latter is said to be the first plywood car ever exhibited. Its makers, a Buffalo corporation, claim it is 1000 lb. lighter than any other closed car of similar wheel base. The company has not yet begun quantity production. The chassis and body are entirely of plywood.

Elmwood music hall, where the show was held, was transformed into a winter palace with surroundings designed to remind visitors of the all year utility of the closed car. It was an exceptionally beautiful show but cars were closely crowded because of the heavy demand for space.

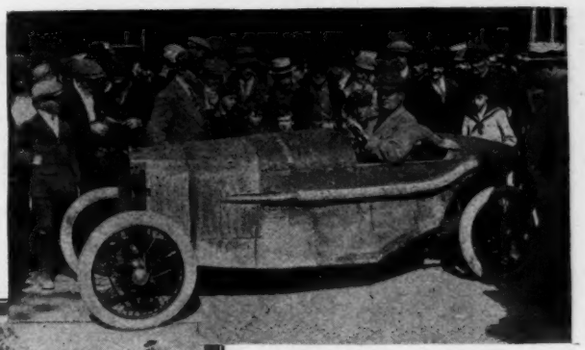
The exhibit was held under the auspices of the Automobile Dealers' Association, of Buffalo, of which E. H. Baker is president. The management was in charge of Carlton Proctor, executive secretary of the association.

PEUGEOT FOR BUFFALO

Buffalo, Oct. 1—A plant of the Peugeot automobile company is to be established in this city according to information received here. The French Motor Corp. is said to have purchased a site in South Buffalo and will immediately begin the erection of a plant. The first unit, a building 120 by 450 ft., is already planned although a construction contract has not been definitely awarded. It is said that the firm will continue to build racing and sport models.

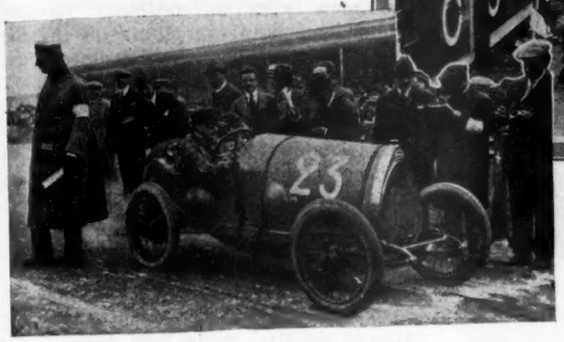


Above—Pickering on Silver Hawk and Guyot on Sizaire-Naudin, starting together in French light car race



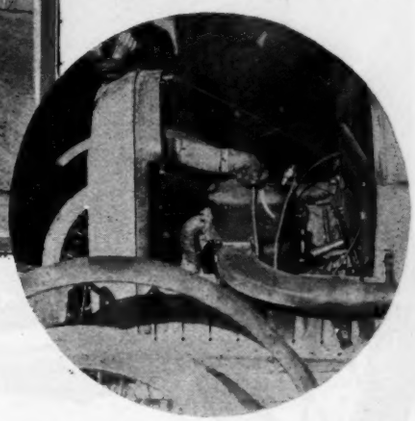
Right—Albert Guyot on his 84 cu. in. Sizaire-Naudin racing machine

Below—Twin cylinder two-cycle engine used on Violet's cycle car which won the race at Le Mans



Above—Rene Thomas on Silver Hawk light car filling up at pits

Left—Ernest Friederich, winner, starting in French light car race



Two-Cycle Engine Wins French 67 Cu. In. Limit Race

Small Car Surprises All with Average of 43.5 Miles per Hour for 170 Miles

BY W. F. BRADLEY

European Correspondent of Motor Age

PARIS, Sept. 2—Out of fifteen machines starting in the French cyclecar race at Le Mans, only three succeeded in covering the distance of 170 miles within the time limit imposed. The winner was Violet on a Major cyclecar equipped with a special two stroke engine of his own design. His time for the 170 miles was 3 hours 48 in. 27 sec., giving an average speed of 43.5 miles an hour. The regulations limit the piston displacement of cyclecars to 67 cu. in. with a maximum weight of 770 lbs. including body. With such regulations the machines are more motorcycle than on car lines.

The fact that the race was won by a two stroke engine caused some comment, for this is the first time in a French race that the two stroke has proved superior to the four stroke. Second prize went to Leveque on a Ruby cyclecar, who finished 10½ min. behind the winner. Third prize was secured by Noel on a Noel cyclecar. All the others dropped out of the race by reason of mechanical failure.

The distinctive feature of the winning machine is its twin cylinder vertical water cooled engine with a common combustion chamber for the two cylinders. Bore and stroke are 2.9 by 4.7 in. Crankcase compression is employed, with a rotary, chain driven distributer. The fresh mixture is admitted into one of the cylinders and exhausted by the other. There is a single plug and the two pistons move up and down together. The claim is made that this engine, which develops 30 hp., is as economical as a four stroke, but in the race it used nearly twelve gal. of gasoline for a distance of 170 miles.

The high percentage of failures in the race can be attributed to the inability of the machines to hold together on a fast course with rough surface. The circuit was roughly triangular and measured about ten miles round; there were some perfectly straight stretches, along which the highest speeds were obtainable, but by reason of war service the roads were very rough, and this soon killed out the competitors. Even the Morgan, which is a well tried type in England, could not stand the gaff. With the exception of the engine used by the winner, no mechanical novelty was revealed by the race.

MOTOR AGE has long been considered the best medium through which to obtain foreign racing news and puts before its readers the valuable experience gained from racing here and in Europe.

Mr. Bradley, European correspondent of Motor Age, describes the running of the French International light car race and the French cyclecar race in a most instructive and interesting manner.

Bugatti Winner of French International Light Car Race

Cars Limited to 85 Cu. In. Displacement and 1100 Lb. Weight. Distance 255 Miles

BY W. F. BRADLEY

European Correspondent of Motor Age

PARIS, Sept. 2—Ernest Friedrich, driving a four cylinder Bugatti of only 2.5 by 3.9 in. bore and stroke won the French International light car race with an average speed of 57.13 miles an hour for a distance of 255 miles. This event, which is the only road race to be held in France this year, was organized by the Automobile Club of Le Mans for machines having a piston displacement of not more than 85 in., and a maximum weight of 1100 lb.

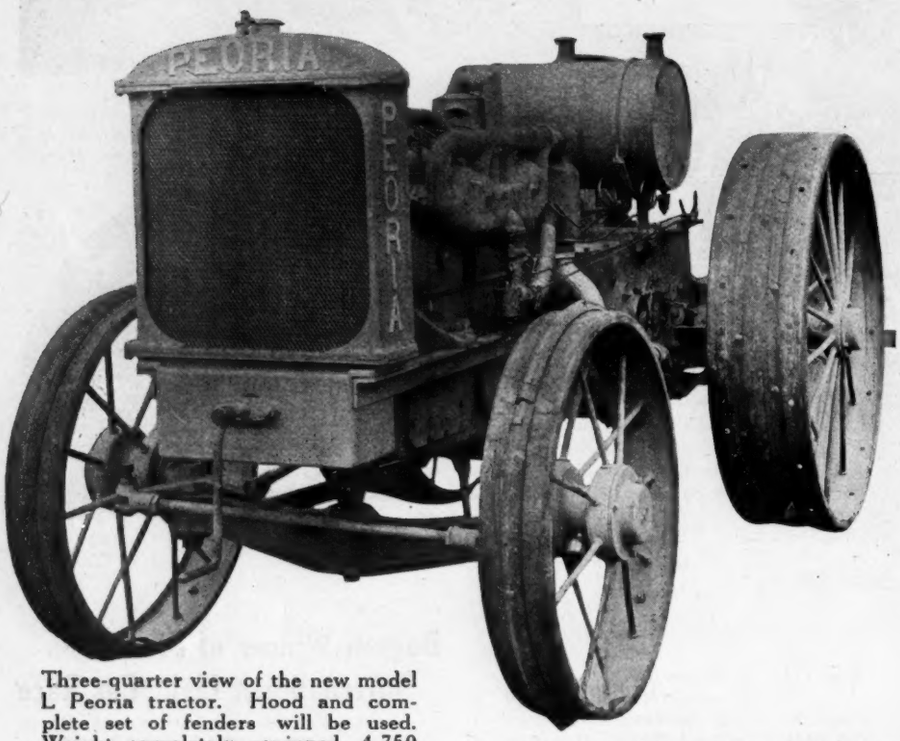
The race was held in the immediate neighborhood of Le Mans, the grandstands being erected on the site of one of the biggest American army camps, vestiges of which still remain. By reason of American army activities around Le Mans, all the roads are in poor condition, and to get the best possible course the club selected a circuit only a little more than ten miles around. This was repaired as far as possible and treated with calcium chloride. While the roads were very straight the surface was rough and the width was not great. This combination made high speeds possible, but the rough surface proved destructive to the competing machine.

There were twenty-one starters in the

(*Continued on page* 33)

Peoria Tractor of Single Unit Type

New Model L Design Has One Piece Casting Which Serves as Frame, Crankcase and Transmission Housing



Three-quarter view of the new model L Peoria tractor. Hood and complete set of fenders will be used. Weight completely equipped, 4,750 pounds

THE model L Peoria is a new live axle tractor that the company has been working on for the past two years.

The main and basic feature of this new machine is the base which is a large steel casting taking the place of the frame, lower engine base and transmission case. This frame or case is made of one piece and the top of it is planed or milled perfectly true. In fact, all openings and surfaces to which castings or parts are attached are machined to within .002 in.

Large Inspection Plates Used

The Model KU, four-cylinder, Climax engine, having a 5 in. bore and a 6½ in. stroke, is used in this machine. The lower pan or base of the engine is removed and the engine is then set on the steel case or frame. The top of the transmission is then bolted to the rear upper half of the engine crank case and the whole is bolted to the frame, which makes a very strong construction and when all shafting and gears are lined up in this steel case, it is absolutely impossible for any of the shafts or gears to get out of alignment.

Larger inspection plates are used on the side of the crankcase than is regularly used on the Climax engine. A lug is cast on the front end of the casting which takes the king pin for the front axle. A lug is also cast on the same casting about 20 in. back of the rear axle which holds the rear end of the radius rods. The front end of the tractor is spring mounted. A cast iron, truck type radiator with removable copper core is used and the lower base of the radiator holds six gal. of water.

Timken roller bearings are used throughout. The front steering knuckle works on a Timken roller bearing, which carries the weight of the front end of the tractor. There is one of these Timken bearings in each end of the front axle which makes steering easy.

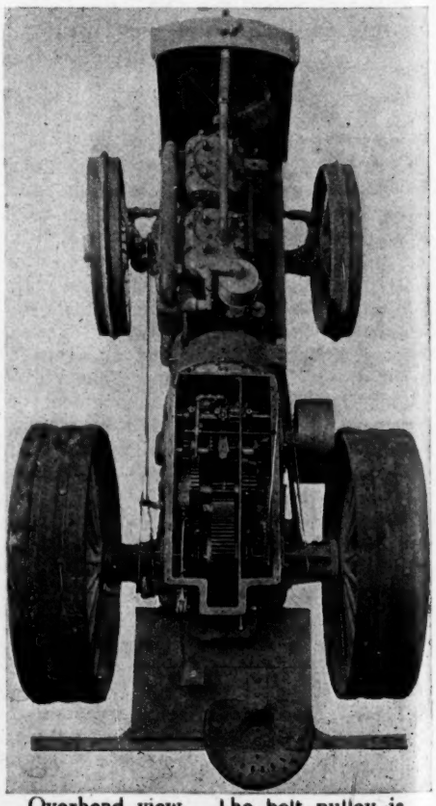
Nickel-steel shafting is used in the transmission and rear axles. The rear axle housings are securely bolted to the outside of the transmission case and in addition to this, they extend into the inside of the transmission case where the end of the housing is anchored to a heavy lug that is cast on the bottom of the transmission case just at the side of the large master gear and differential case. This makes a much more solid bearing for the differential to work in.

Gear Assembly Simplified

The gears on each transmission shaft can all be assembled before they are put into the case. The differential can also be assembled and the master gear bolted to it before it is installed into the case. This makes the assembly much easier than if some of these parts had to be put on the shafts inside the case and is a great deal better for the farmer in case he has to work on any of these parts as they can be taken out. The clutch assembly can also be put together outside the case and then dropped right in. The manufacturers state one man can remove the complete clutch in the Model L Peoria tractor in less than one hour. One man with an ordinary monkey wrench can strip everything off the top of the transmission case and clutch case in less than thirty minutes, it is claimed.

Pump to Force Oil Over Gears

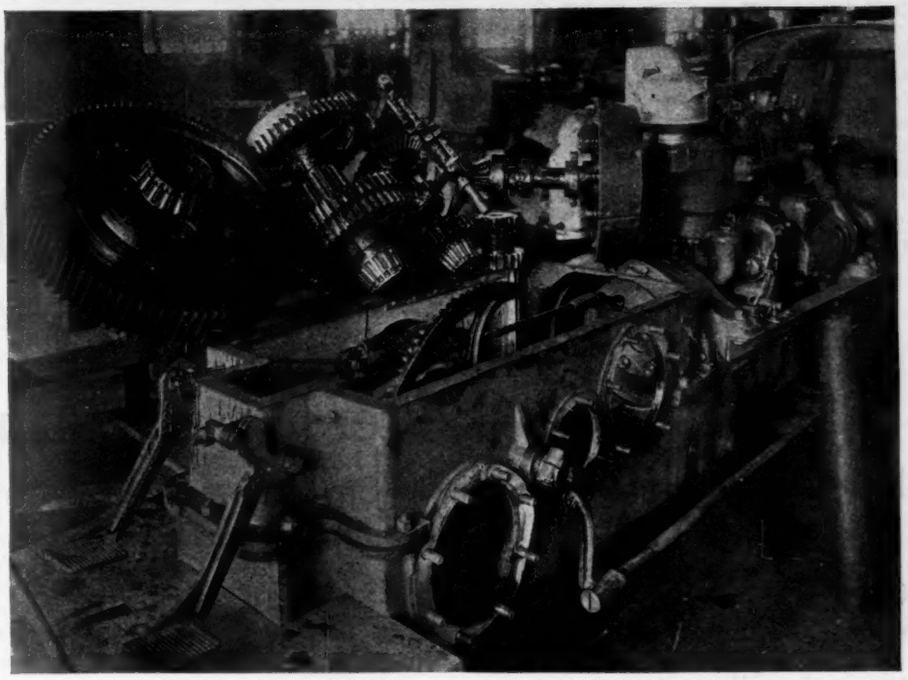
All transmission gears run in oil and in addition to this, a transmission oil pump is used which pumps the oil from the lowest part of the transmission case over all the gears except the master gear and pinion. Therefore, when doing belt work, the gears in the transmission are as thoroughly lubricated as when the machine is working in the field doing plowing or other traction work. It often happens when doing belt work that the tractor is set on a hillside with the front end toward the top, in which case, unless the transmission case is filled full of oil



Overhead view. The belt pulley is on the right side and in line with the driver's seat

Specifications of 12-25 hp Model L Peoria Tractor

Bore, 5 in.
Stroke, 6½ in.
Horsepower rating, 34 B.H.P.
Drawbar horsepower, 12.
Belt horsepower, 25.
Radiator Eureka, Diamond honeycomb type; top and bottom tanks cast iron truck type.
Final drive to rear wheels, spur gear.
Swinging drawbar adjustable with lever at rear of platform.
Height of drawbar, adjustable to 14, 17 and 19 in.
Wheelbase, 80 in.
Number forward speeds, 3.
Miles per hour, 2, 3 and 4.
Drive pulley-diameter, 15 in.; face, 7 in.
Revolutions of drive pulley at 800 r.p.m. of engine, 650.
Belt speed at 800 r.p.m. of engine, 2,400 ft.
Fuel, kerosene.
Capacity kerosene tank, 30 gal.
Capacity gasoline tank, 4 gal.
Hood over engine; sides enclosed;
Fenders over top of rear wheels.
Large platform.
Air cleaner, water type.
Weight, approximately 4,700 lbs.
Painting, grey, with ivory striping.



The gears on each transmission shaft can be assembled before being put into the case. This makes for simplicity of assembly. The clutch assembly can also be put together outside the case and then dropped in

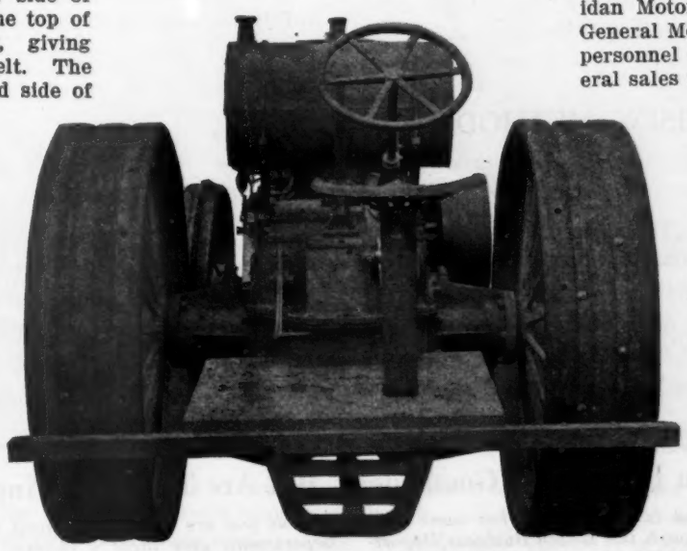
or grease, the gears on the belt pulley shaft will not touch the oil.

The oil pump is of the plunger type and works off a cam that is fitted on the clutch shaft, making a very simple installation. The belt pulley runs only when doing belt work. This is accomplished by shifting the high speed pinion into the belt pinion and when through with the belt work, the pinion is shifted back to neutral position. The lower side of the belt pulley is 9 in. above the top of the front axle, consequently, giving plenty of clearance for the belt. The belt pulley is on the right hand side of the tractor and in line with the driver's seat.

Three Speeds Forward

The model L has three speeds forward and one reverse, namely: two, three and four miles per hour. Three miles is the regular plowing speed.

The front wheels of this tractor are 36 in. high with 6½ in. face and run on Timken roller bearings. Rear wheels are 50 in. high with a 12 in. face. Wheelbase, 80 in. Extreme width, 66 in. Distance from inside of rear wheel to exact center of tractor, 21 in. Spring drawbar attached to rear end of steel case. The drawbar is adjustable to three different heights, 14 in., 17 in. and 19 in., and has a lateral adjustment of about 18 in. Hood and complete set of fenders will be used. Weight, including hood and fenders, 4750 lbs.



Rear view of the Peoria model L. The drawbar is adjustable to three different heights

RECEIVER FOR LOW PRICED CAR

Indianapolis, Oct. 1—Receivers were appointed yesterday for the Spacke Machine & Tool Co., manufacturers of a two-cylinder air-cooled car selling at $295. The application was filed in Superior court by the company itself, which admitted that it was unable to meet its obligations as they come due and sought to protect the interests of all creditors. The receivers named were Charles A. Roember and Robert Fenstel.

The company was incorporated in Indiana in 1917 with a capital of $1,250,000 common and $2,500,000 preferred stock. Only $500,000 of each class has been issued, however. All the common is owned by the Spacke Machine & Tool Co. of Delaware. The company manufactures motors and tractor parts in addition to automobiles. Two of its three plants in Indianapolis have been devoted to the production of the Brook car.

SHERIDAN PERSONNEL ANNOUNCED

Muncie, Ind., Oct. 1—D. A. Burke, president and general manager of the Sheridan Motor Car Co., a new unit of the General Motors Corp., has announced the personnel of the organization. The general sales manager is J. G. Wilmoth, who has been with General Motors for several years; manager of production, W. H. Farr, who started with what is now a General Motors division in 1903; engineer in charge, Hugh Law; manager of service, T. H. Stambaugh; purchasing agent, F. J. Martin; supervisor of material, F. B. Sturt; manager of advertising, M. M. Roberts; body design engineer, E. W. Northrop; comptroller, L. H. Kilets; manager of traffic, W. L. Shirey; mantenance engineer, E. S. Goodin.

The factory is designed for big production, and it is planned that by July 31, next year, 10.000 four cylinder cars and 3500 eight cylinder cars will have been made.

A Department of BETTER BUSINESS

Conducted by Ray W. Sherman

For Better Tractor Business

Push Better Farming—Give Time to Promoting Farm Movements — Below Are Some Practical Thoughts on Action the Dealer Should Take

STRIVE to become an authority, a center to which all thought on power farming in your territory will naturally gravitate. The dealer who will win in the selling of tractors is the man who knows. Knowledge usually controls the situation, if the transaction relates to selling or to the establishment of confidence. Study local conditions, take a day off once in awhile for visiting prospective customers. You will get a glimpse of your business as it looks to the man you are trying to sell. Live dealers attend fairs, shows and conventions.

AND SELL WITH ENTHUSIASM

Push your wares with knowledge and with the enthusiasm that results from knowledge. Deal cold bloodedly with the factory or the people you buy from if you will, but carry the air that is a pleasure to deal with your trade, and that you are doing them a real service. Do not go too far in the free service idea. People want service but are usually willing to pay for it. Of the two methods, giving no service and giving service for a price, selling the service is the better.

STUDY ADVERTISING METHODS

Do not be influenced by broadside circulars so much as by the actual appearance of advertising in papers that reach your trade. Be wary of the manufacturer who advertises "at" you instead of for you. If a salesman tries to impress you with a big spread in a publication, ask him how much of its circulation goes to people in your territory and make a study of the publication to see if it is editorially fighting the problems of your territory. Remember that the manufacturers who have been the most successful in the agricultural field are those who have run the most consistent and continuous campaigns in papers edited for the territories in which there are the best markets for their goods.

HELP DEVELOP THE INDUSTRY

Collect data on the uses of the tractor and report new uses that you have discovered. These will find their way into print and will encourage other dealers to do likewise; all of which will help further the general sale of tractors. Remember you cannot expect a big business in your territory unless there is a general movement toward the tractor. Some dealers in the hard winter wheat belt are organizing "Deep and Early Plowing Clubs" and are giving prizes to the farmer who gets the best results from tractor farming.

READ THE BUSINESS PAPERS

Read the farm papers and be able to talk the new and important developments of farming in your section. Get in touch with the paper that is doing the most for your territory and discuss the problems of farming with it.

PLAN AHEAD

Anticipate the wants of your section. Do not wait for the demand to be created independently of you. Join and keep in touch with the efforts that are creating the demand, chief among which is advertising. Be ready for a call from higher up the line, either the offer of a valuable position or a self-created field of increased activity.

You Have Some Good Ideas, But Are They Working?

One idea in your own mind is one idea. That same idea given to 30,000 other men through the Better Business Department of Motor Age becomes 30,000 ideas.

Ideas help us all. They are the beginning of money-making plans. The smallest good thought may lead to a big result.

Just as you are getting the good ideas of others through this department, give them a chance to get square with you by using one of yours. For the trouble of writing the idea Motor Age will send you ONE DOLLAR, and you have the satisfaction of having done the industry a service.

Serve 'Em Right!

The thing which draws the customer to the dealer or garageman is the manner in which the customer is treated. If you're going to do anything for a customer, do it promptly, and keep your promises.

If you promise to fix a car on a certain date, make a record of it in a book or file and make it someone's duty to see to it that the promise gets attention on that date. If you can't keep the promise, at least call the customer up and set a new date. But don't let him feel he is being neglected.

You Can Use This Idea

An Iowa garage owner who is going after the tourist business gives them a post card which is addressed to him and tells them to drop him a line and tell how the car is working. This makes them feel he was trying to do good work and was interested enough to want to know what kind of satisfaction his work gave. In a large percentage of instances the card is brought back but often by another tourist who needs his services.—S. E. Gibbs, Corydon, Ia.

Did You Ever—

Did you ever stop to think that what you have done during the past hour is about one-eighth of what your day's work will be?

And that what you intend to do during the next hour will be another eighth?

Figure it out!

This Idea Sold a Truck

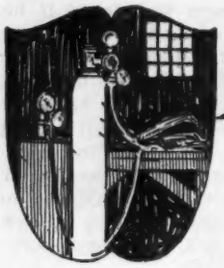
An Iowa dealer often finds that the farmers are too busy to talk about trucks during the spring. A dealer who had read a statement in a farm paper which said a load of manure was worth $5 decided to get an interview with a certain farmer so loaded up a ton of manure which the city was glad to get rid of, drove out to the farm and asked if he could unload it on his farm. The farmer was glad to get the fertilizer and when he figured what he could make hauling from town at $5 per ton he decided he could pay for the truck easily that fall so had it run in the shed. He uses the same argument when a farmer says the tractor and truck do not give back anything to the soil and also says to keep a cow instead of a horse.—S. E. Gibbs, Corydon, Ia.

Cut Building Costs

Many dealers are needing more room but haven't the nerve to build at present prices and some of the best of business men tell us this is no time to invest money in buildings. George Penniwell, a contractor at Leon, Iowa, has a solution for the problem. He went to St. Joseph, Mo., and bought several carloads of cobblestone and paving bricks that were beyond the useful stage in pavements and is building them into very artistic structures. Such buildings will answer very well for garages.—S. E Gibbs, Corydon, Iowa.

Window Display Sells Thousands of Piston Rings

The Whiton Hardware Co., Seattle, one of the largest automotive equipment houses in the Northwest, recently demonstrated the value of attractive window displays in selling large quantities of piston rings. One novel feature of the display was a chain made entirely of No-Leak-O piston rings linked together and festooned from the ceiling around the center card, which was forcefully lettered, "A Chain of Power." The attention of passing owners of the popular priced cars was attracted by the use of five cards, one each for Ford, Studebaker, Buick, Oakland and Chevrolet. A striking background effect was secured by the use of a number of attractive three panel window displays and small display cards which were furnished by the No-Leak-O Co.



Autogenous Welding

What it is and how it is applied

THIS is the twelfth of a series of articles on autogenous welding and gives practice problems in adding the welding rod. These articles are intended to be of aid to the man who must learn the art of welding with little or no personal instruction. They also are intended as a reference for the man attending a welding school. It is likely that during the first few months of his instruction many problems will come up that may be solved more readily with these articles on hand.

Finally, this series should be of benefit to any automotive service man or repairman, even though he never intends to have a welding torch in the shop. The reading of these articles will give him an understanding of the subject which should greatly aid him in general repair work. He will be better able to decide, when he has a part to repair, whether it is feasible or not to weld it, and if so, if it will pay. The more familiar one becomes with this art, the wider the scope of its application. The man who is versed in the art will find many clever applications that one who is less familiar with the subject would never dream of. An understanding of welding principles offers a new technique to the repair man.

Part XII—Adding the Welding Rod

BEFORE attempting to use a welding rod the swinging motion should have been mastered and the operator should be able to do reasonably satisfactory work in the welds already described which require no rod.

It is not difficult to imagine that it takes some practice to acquire the knack of co-ordination between the two hands, the one holding the blowpipe and the other the welding rod.

The welding rod should be inclined at about the angle shown in Fig. 32. With the welding rod in a more nearly vertical position there is danger of melting off too much metal, part of which may not be fused.

In adding the metal, care must be exercised that the edges of the weld are in the proper state of fusion to receive the extra metal. The edges should be bordering on the molten state, otherwise the added metal may stick to the sides and not make a thorough bond as would be the case if fusion were perfect.

The usual faults of the beginner are:

1—Failure to introduce the welding rod at the proper time.

2—Holding the rod at the wrong angle.

3—Fusing either too much or too little off the rod.

4—Allowing the filling rod material to fall off into the weld in drops or globules.

The proper procedure is to lower the welding rod into contact with the molten metal of the edges. When in this position, the flame of the blowpipe is directed around it and complete fusion is obtained.

It is general practice to add excess metal to the section for several reasons:

1—The weld is reinforced and the strength is accordingly increased.

2—In case a finished surface is desired there is sufficient stock for machining.

3—Small pinholes or blowholes usually occur just under the surface of the weld. Therefore, if there is excess metal the pinholes are in it and the strength of the welded section is unimpaired.

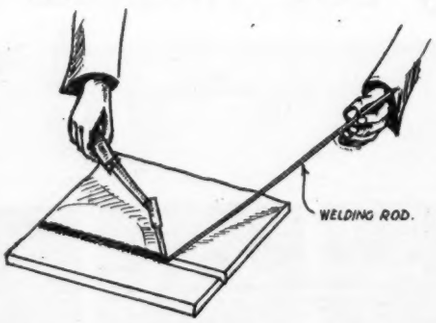


Fig. 32—This sketch shows the correct angle at which to hold the welding rod

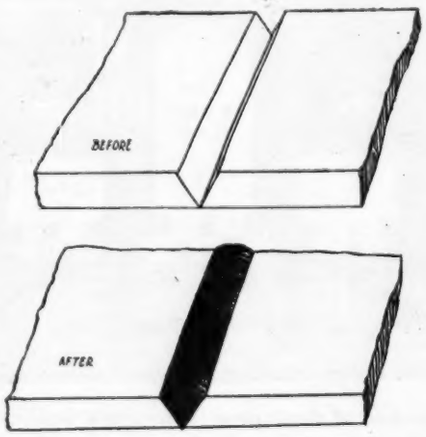


Fig. 33—A filling rod is required for plates ¼ inch wide in thickness. It is desirable to add enough metal to "round off" the V as shown

Adding the Filling Rod

Two two ¼ in. plates, Fig. 33, and bevel the edges to 45 deg. According to the table, page —, a ⅛ in. welding rod should be used for plates ¼ in. thick.

One end of the seam is brought to a welding heat and at that moment the rod is introduced. The filling rod is held in the left hand at an angle of about 60 deg. with the blowpipe. The filling rod is held ⅛in. to 3/16 in. in front of the flame. After the bevel edges of the plate are brought to a welding point the rod should be held down in the V in the molten metal, the flame being moved around the rod and not on it. In this manner feed the welding rod to the joint until the V is built up 1/32 or 1/16 in. thicker than the original plates. Proceed in this manner until the joint is completed.

It is wise to observe these precautions:

1—Do not start to add the filling rod until the bottom of the V has been melted together.

2—Do not place the cold welding rod in the molten metal.

3—Always be sure that the welding rod is melted into metal that is already molten.

4—Do not hold the end of the filling rod above the metal and allow it to drop into the weld.

5—Do not add the metal from the filling rod to the cold metal of the weld.

6—Do not force the molten metal ahead on the cold sides of the V.

7—Be sure that both sides of the V are brought to the melting temperature at the same time.

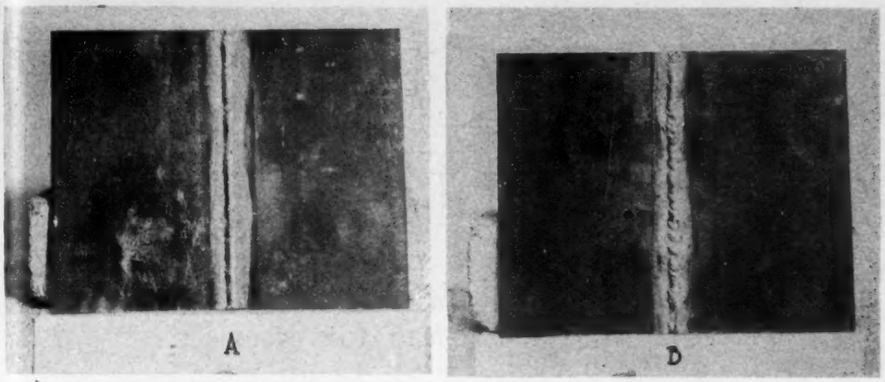


Fig. 34—A and B illustrate good and poor welds, respectively. The good weld is indicated by the uniform structure of the seam and the poor weld is shown by the irregular structure of the seam. At one point is shown where the torch burned through because it was held in one spot, this point then being filled up with the rod. The general criticism on this weld is that the operator attempted to do the job too quickly

BUGATTI WINS FRENCH LIGHT CAR RACE

(*Continued from page 23*)

light car race, the competitors being sent away in pairs at half minute intervals. Only seven machines finished; twelve were put out by reason of mechanical failures, one was disqualified and one abandoned when he found that it was impossible to finish within the time limit. Viscaya, on No. 1 Bugatti, made the fastest initial lap, at an average of 61½ miles an hour. He was closely followed by his teammate Friedrich, who eventually proved to be the winner, and by Violet on a Major cyclecar of 67 cu. in. piston displacement. This machine had run the previous day in a cyclecar race over the same course, and had won that event. Its high speed in the light car race made a great impression and the daring of its driver appealed to the crowd. The Violet has a twin cylinder two-stroke engine, with crankcase compression but without deviator. The two cylinders have a common combustion chamber, and intake is by means of one cylinder and exhaust by the other.

Troubles Start Early

Although the quality of the machines in the race was very high, mechanical troubles began at a rather early hour. Albert Guyot and his teammate Honol both went out after a couple of laps with broken steering gears on their Sizaire-Naudin machines. Colomb, on a La Licorne, estimated to be one of the fastest, was held up with a burnt clutch leather. A temporary repair was made, but this did not hold and the machine was withdrawn early. The Bignan-Sport team lost De Courcelles at quarter distance by reason of magneto failure. Of the Majola four, Carteau went out with valve trouble, Leduc broke a connecting rod, and Muraour retired with a hole in the crankcase.

England was represented in the race by three Silver Hawk light cars, one of which was driven by Rene Thomas. These cars were afflicted with a thermo-syphon cooling system which proved insufficient under constant hard running. Pickering, one of the drivers, poured cold water into a hot engine and cracked the water jacket. Thomas stopped at half distance for water, but a crack having developed in the water inlet pipe soon after this, he was obliged to stop for every one of the last ten laps in order to take on water. He finished the race, but in comparatively slow time.

At half distance the race looked like a complete victory for Bugatti, for these cars were first, second and third, the leader having an advance of seven minutes on the fourth man, Nougue, on a Bignan-Sport. There were twelve machines in the race at this time, but soon afterwards the Englishman Marshall, on a French Mathis, had to withdraw owing to a broken magneto drive, and Violet after making a fine display went out with broken chain and leaking radiator.

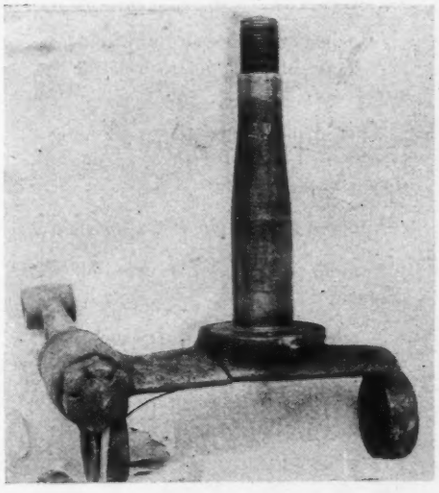


Fig. 35—A broken steering knuckle. Two parts of the knuckle should be braced or wired in place as shown. The metal at the back is of sufficient thickness to warrant veeing. However, the V will have to extend in at a sharp angle so as not to cut into the shoulder at the base of the wheel spindle. This welding job offers no difficulties and need not be described further, except perhaps to call attention to the fact that it is desirable to secure proper alignment of the two parts by placing the king pin in position. It is also wise to cover the king pin with asbestos paper so that it will not be injured by the flame

Four laps from the end, when Friedrich was in the lead, with Viscaya second and the third place very keenly fought for by two Bignan-Sport cars, No. 1 Bugatti came in for oil. Just as the car was moving off Mr. Bugatti appeared to detect some sign of overheating, for he shouted to Viscaya to stop, ran after the car and began to unscrew the radiator filler cap. Without a moment's hesitation the jury disqualified the car and gave orders that it should not be timed. This decision was strongly disapproved by the spectators, who had greatly admired the way in which the Bugatti had been handled in the race.

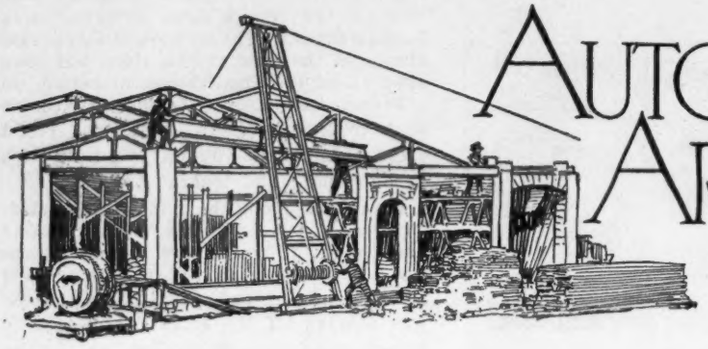
In announcing this disqualification, the jury acted strictly according to the letter of the law, which states that all mechanical work must be done by the driver and his mechanic. They appeared to have overlooked the fact, however, that Mr. Bugatti, after having touched his car, had the right to take the place of either the driver or the mechanic. He was not given this option, for the car was ruled out instantly and without appeal. A similar case occurred in 1913 when an outsider cranked a Delage which could not be started up by Ballot or his mechanician, and then, in order to comply with the rules, took the place of the appointed mechanician for the rest of the race. Viscaya started out while the officials and the team manager were discussing, but when he came round to the grandstands again, he was flagged off the course. The driver was cheered and the officials hooted.

Thomas Finishes Seventh

During this incident Braccoli, of the Bugatti team, came in for a change of plugs. In the excitement and disorganization the work was not done very quickly and the engine could not be started owing to a flooded carbureter. This delay gave the opportunity to Nougue and Delaunay, on Bignan-Sport cars, to get into second and third places, and also allowed Rose of the Majola team to pick up fourth prize, Braccoli only coming in fifth. Gedge on Silver Hawk, and Rene Thomas on the same make of machine, followed in sixth and seventh positions. An English G. N. retired a short time before the end owing to the crowd having invaded the course.

The winning Bugatti car was built in 1914 at Molsheim, Alsace, then German territory, but on war appearing imminent this and other cars were run into Italy in order to save them from German requisitions. Ettore Bugatti, the builder of the cars, although of Italian nationality, was obliged to leave Alsace and immediately took up the work of designing and producing airplane engines for the Allied forces. The racing cars were

(*Concluded on page 35*)



AUTOMOTIVE ARCHITECTURE

Planning and Building Problems

CONDUCTED BY TOM WILDER

Corner Sales & Service Station With Mezzanine Floor

No. 274-A

We are planning on erecting a one-story salesroom and workshop on our corner lot, 70 ft. by 98 ft., and would appreciate some suggestions on the plan we have drawn up. Also if you have any prints showing outside architecture something on the order of the California styles, we would appreciate having copies of them to aid us in deciding upon the style for our building.—The Superior Motors Co., Portsmouth, Ohio.

Your arrangement should, with a few minor changes, work out into a first class layout.

Your aisles are so narrow that it would be almost impossible to get cars in and out of the storage spaces. A car should be allowed at least its own length and we would plan to keep the short cars on one side with a narrow aisle, and the long cars on the other side with a wide aisle.

The space at the turn of the aisles is of no use for storage and could best be added to the shop as it is necessary to cut down the width of the shop to 25 ft. This width is not as good as 30 ft. but makes a very good shop, nevertheless, with no waste.

Instead of using floor space in your office section for stock, why not make a mezzanine floor over the ell shaped office and accessory store and devote it all to stock. The stock could be received from the garage side through a high doorway to avoid carrying it through the office or accessory store.

Beside making the office space more roomy, removing the stock room makes possible a woman's room which is beginning to be considered essential and will be more so as time goes on.

We have no prints of elevations along the line you desire but many photographs in this style have appeared in MOTOR AGE and some very recently. If you will consult your files no doubt you can find some of them that will give you suggestions.

We do not care for the corner entrance doorway, the space being too valuable as a show window for your best looking car.

No. 274-B

CENTRALIZATION OF DEPARTMENTS

We sent you a sketch of a one-story garage which we were planning to build, but since doing so have decided to make it two stories with the workshop, paint department and dead storage on the second floor. Under the new arrangement we want a showroom at least 40 by 40 ft. with office, accessory store and parts stockroom situated so that one person in the office can take care of all. We will also want the gasoline, oil, air and water station just outside the office so that the same person can look after this.

We are planning to have a dumb waiter directly over the office so that parts can be sent up to the repair shop when needed. We want a driveway with entrance on John Street and exit on Ninth. This will leave us storage space on the Ninth Street side for a number of cars and leave plenty of space at the other end of the building for live storage and wash rack.

We want to arrange accessory displays where the machines stop for oil and gas as well as along the aisle where the machines drive in and out.—The Superior Motors Co., Portsmouth, Ohio.

The one story layout was completed before receiving your second letter, and we are, therefore, making an entirely new layout.

You have again allowed insufficient space for aisles and car maneuver and while your former layout could be used with changes, this one is quite impossible.

In making your plans, if you would use a definite scale, you would be much better able to tell how they were coming out. In this plan, as in the other, you try to make use of the corner where cars could not be gotten in and out without moving others.

In case you feel the necessity of more storage room for cars on the main floor, you could arrange the first floor as in the first layout with a double row of cars at the back side or as in the miniature layout. In the latter case, the cars are all accessible.

IN this department MOTOR AGE aims to assist its readers in their problems of planning, building and equipping service stations, garages, dealers' establishments, shops, filling stations, and in fact any buildings necessary to automotive activity.

When making requests for assistance please see that we have all the data necessary to an intelligent handling of the job. Among other things we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

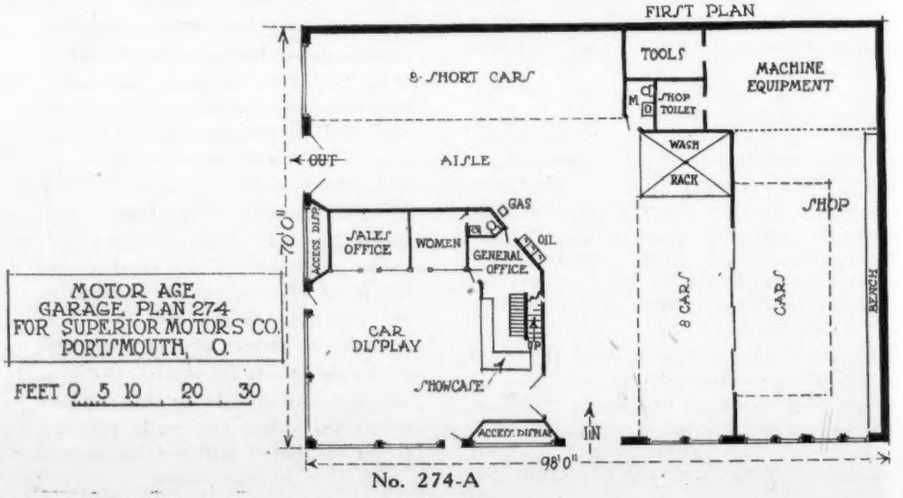
What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

And how much of an accessory department is anticipated.



No. 274-A

No. 275

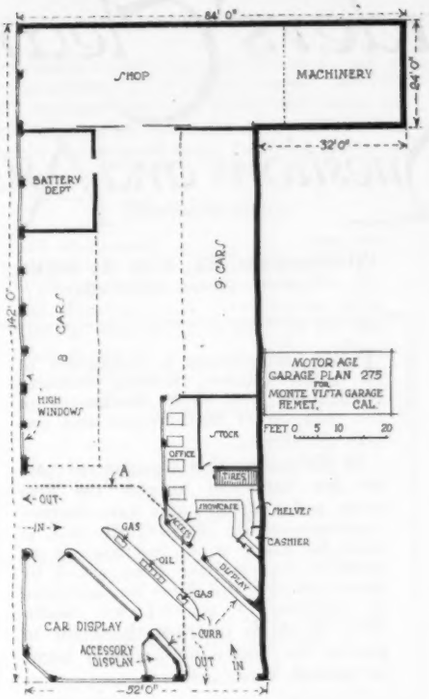
RE-ARRANGEMENT OF FRONTAGE FOR DOUBLE DRIVEWAY

Would appreciate suggestion as to a plan for the front end of our building to include office, accessories and display room. We want to take our gasoline pumps off the street and put them under cover of the building, making a double driveway through the corner, and at the same time arrange for a room to display a car in front. We have very little storage. Floor space in the garage is needed mostly for cars in for repairs and from twelve to fifteen is all the cars we need space for. We work six men in the shop, carry $2000 in accessories and $2500 in tires.—Monte Vista Garage, Hemet, Calif.

Should you arrange the front of your garage as you suggest, you would really change it into a filling station unless you are very careful. It has always been the opinion of this department that the corner filling station in connection with general activities, including car sales, is not good policy inasmuch as it utilizes the most valuable space in the establishment and puts all other departments in the background.

In this layout, however, the show room for two cars and the large accessory display, prominently located on the corner, will tend to preserve your status as a motor car dealer.

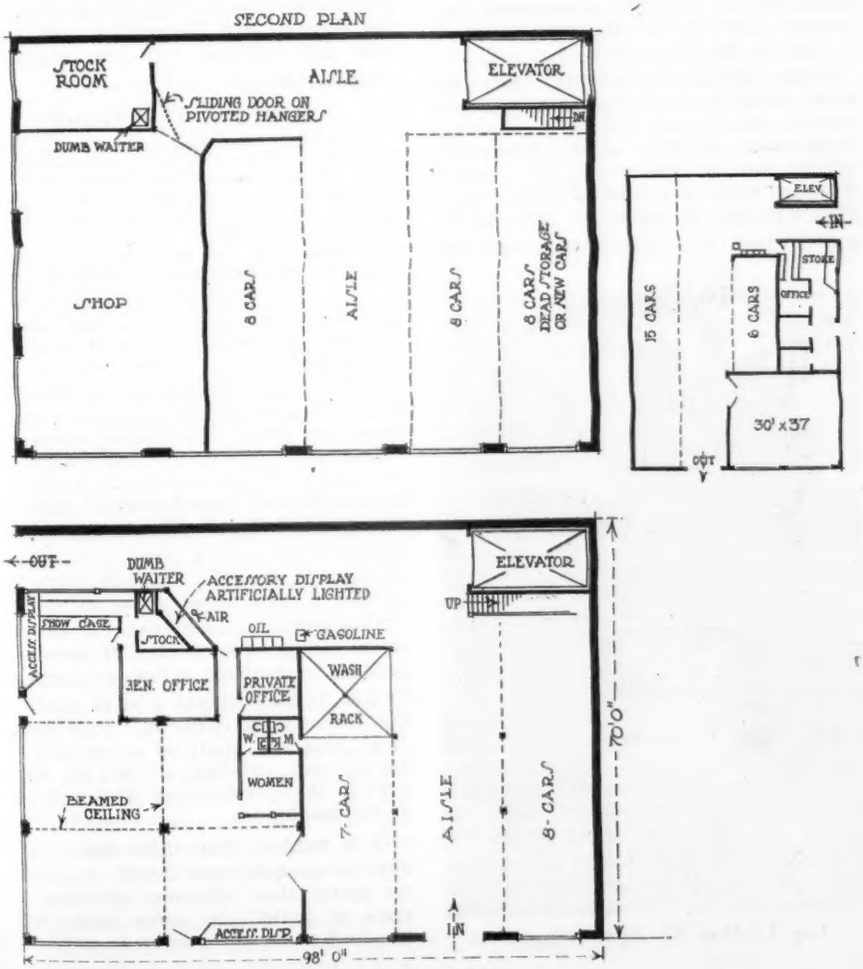
You might further accentuate the importance of cars and accessories by grouping the accessory store and office with the show room on the corner, about as indicated by the line "A".



No. 275—Corner display room

The office in the layout has a rather strategic position since it commands a view of the garage, accessory store, pumps and car display room as well as both entrances.

Skylights will be necessary in order to give the office accessory store and driveway good lighting, and will also make the whole layout more attractive.



No. 274-B

BUGATTI WINS FRENCH LIGHT CAR RACE

(*Concluded from page 32*)

brought into France before the end of the war and were made use of for carbureter, spark plug and other experiments.

The engine used on the Bugatti cars is a four-cylinder in one casting of 2.5 by 3.9 in. bore and stroke. There are four flat-faced valves per cylinder operated by an overhead camshaft and curved rocker arms, the camshaft being operated by a vertical shaft and bevel gearing. Pistons are of aluminum, with three rings, and lubrication is under pressure. The power obtained is 29.5 at 2750 revolutions. A Zenith carbureter is employed and ignition is by high tension magneto. On No. 1 car, which was disqualified, single plugs were used; on the two others there were two plugs by cylinder.

One of the most remarkable features of these cars is the way they held to the road at high speed. In this respect they were undoubtedly the equal of the best big racing cars ever built and were very much superior to any other machines in this race. Semi-elliptic springs were used in front and inverted quarter elliptic at the rear. The gear ratio in the rear axle was 14-15, with wheels of 710 by 90. Friedrich covered the entire distance without getting out of his seat.

Develops 35 Hp. at 3000 r.p.m

The Bignan-Sport cars, which finished second and third, have four cylinders in a block casting of 2.4 by 4.68 in. bore and stroke. The valves, with inclined stems, are on opposite sides, operated by two camshafts in the base chamber. Steel pistons are used and lubrication is under pressure. At 3,000 revolutions the engine is declared to develop 35 hp. and to have a practically flat power curve up to 3200 revolutions.

A cone clutch is used, with four speed gear box and central drive. Cantilever springs are employed. One of the excellent features of these cars is the use of front wheel brakes, which are operated without any external joint. The pedal operates the brakes on all four wheels, the side lever operating the rear wheel brakes only.

Majola had four-cylinder engines of 2.5 by 4 in. bore and stroke, with valves in the head, operated by an overhead camshaft which received its movement from the crankshaft by means of an enclosed silent chain. The crankshaft is carried in ball bearings, steel pistons are used, and connecting rods are tubular.

The Licorne car, which was eliminated by reason of clutch trouble, has an interesting four cylinder engine of 2.3 by 4.8 in. bore and stroke, with cylinders cast separately but mounted up close together so as to form a common water jacket for the four. This engine was designed and built in 1914, but owing to the war it has not previously taken part in a race.

The Readers' Clearing House

Questions and Answers

CONDUCTED BY ROY E. BERG
Technical Editor, Motor Age.

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by some one else and these are answered by refernce to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

HUP 32 CLUTCH ADJUSTMENT

Q—In shifting gears on a 1914 model 32 Hupmobile car the clutch slips. How can this trouble be eliminated?—Rob Hochguertil, Peru, Ill.

1—It will be necessary to remove the cover over the magneto back and also the hand-hole cover to adjust the clutch. Remove the four bolts that hold the cover in place and slide it out. The hand-hole cover is removed by taking off the four nuts holding it in place. Be careful not to destroy the gasket; but if destroyed cut a new one from blotting paper.

Now turn to Fig. 1. At 1 you will see rather large sized nuts—six of them as the crankshaft is turned one complete revolution. You ought to have a socket wrench to handle this job and one belongs with the car's outfit. Mark the first nut with a punch so you will know when you have been all the way around. When you turn this nut in a clockwise direction you will hear a click when a slot engages. There will be three clicks to one complete turn of the nut. Turn the nut until you hear and feel three clicks.

Then turn the engine by hand slowly to the next nut, repeat the operation and so on until you have adjusted six nuts. This will make a perceptible difference in the tension of the spring. Do not forget to drain the oil from the gear case by removing the plug at the bottom and immediately back of the flywheel housing. Run kerosene through, with the plug in, and this will flush out the oil in the transmission and clutch. Work the clutch lever while the engine is being turned a few times by the starting motor. Drain off the kerosene and we are sure the clutch will hold.

APPERSON GEAR RATIO

Q—What is the gear ratio of the 1916 Apperson Six?

2—What is the approximate weight of the Reo 4 engine 1914 model exclusive of clutch?—Frank Ballard, Walton Jct., Mich.

1—The gear axle ratio is 3.92 to 1.

2—It would be rather difficult to state the exact weight of this engine without some definite record but as a rule engines of this type weigh about 600 lbs.

NOISY AXLE

Q—A 1915, Series 6 Norwalk car, when driven at a speed of 18 m.p.h., produces a roaring noise which seems to come from the rear system of the car. When the speed is increased to 21 m.p.h. the noise stops. New pinion bearings and gears have been installed but the noise was not eliminated. Can you explain how the trouble can be remedied?—L. L. Diehl, Huntington, West Va.

1—This roaring noise in the rear axle may be due to poor adjustment. It seems

Miscellaneous

indicative of two possible conditions. If the adjustment is too tight there will be a steady noise when the car is traveling at a constant speed. This is due in most cases to the differential carrier not having sufficient side play or is too tight to have a floating action.

Gears which are adjusted with too much slack between the teeth will produce a noise when the car is coasting. If the gear mounted on the differential carrier does not run true it will produce what is known as an out of round sound. This will be noticed by an intermittent growl which will occur every time the high spot on the gear comes into contact with the pinion.

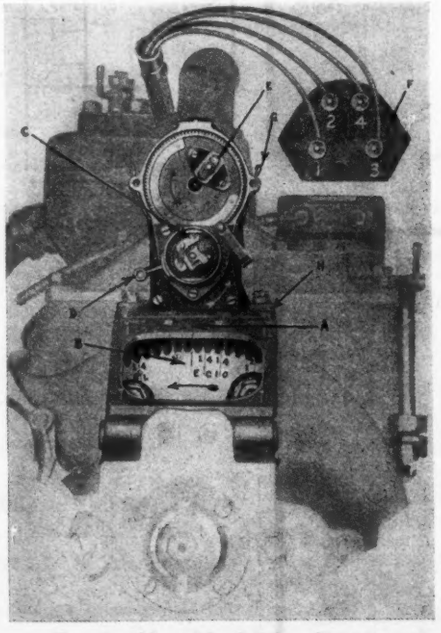


Fig. 1—Hup 32 clutch adjustment

This condition may be due to a broken bearing, an improperly adjusted machined gear or the gear having come loose on its mounting on the differential carrier assembly. The only suggestions we can make is that you go over all of the things mentioned and make adjustments.

The adjustment which will give the most quiet operation is always best determined by trial.

TRANSMISSION LUBRICATION

Q—Does the grease from the transmission in a 1917 Saxon six get into the rear axle? How can one determine when enough grease has been put into the transmission? A plug on the rear axle but what about the transmission?—Walter Schroeder, Woodstock, Ill.

No. The transmission and differential are lubricated separately. Both housings are to be supplied with two quarts of the proper lubricant and the car manufacturers advise removing the oil from the transmission every 2000 miles, cleaning the transmission thoroughly with kerosene and refilling with two quarts of non-fluid oil.

BUILDING A TRACTOR

Q—Would it be practical from a financial standpoint to build a tractor of the crawler type using the engine and the transmission of any high powered automobile, for example the Simplex 70 or the Locomobile 48, etc.?

2—Where could a rear axle and differential be obtained that would prove rigid enough to sustain the various strains for the plowing speed of about two and one-half miles per hour? Can you suggest a design for the tractor?—Sam Kitazima, Los Angeles, Cal.

This project would not be practical from a financial standpoint and furthermore, we doubt very much whether it would prove practical from an owner's viewpoint. In the first place, it has been proven in many branches of the manufacturing world that it is impossible for any individual to build a piece of machinery as cheaply as a large manufacturer and besides it will never prove as satisfac-

This is due to the fact that a manufacturer makes a specialty of some one product or perhaps a few products and he has at his disposal a large engineering research department. This department makes a study of every detail of design and extends all of its efforts toward the development and perfection of the machine.

It is natural that under these conditions a manufacturer builds a machine far better than any one individual can hope to build. In some cases where standard parts are used it is possible to

build a very satisfactory piece of machinery but never at less cost than a manufactured article.

2—In view of the way in which the first question is answered we do not believe these references will be of any value and besides it is probable that it would be impossible to obtain the parts.

PACKARD OILING SYSTEM

Q—What is the gear ratio and speed of a Packard car model 1-38 equipped with a speedster body?

2—Would it be advisable to leave the baffle plates out of this engine and disconnect the oil leads to the cylinders.

3—How much compression should this engine have in order to insure good running?—Earle Ellithorpe, Tulsa, Okla.

1—The exact gear ratio is not available but it is approximately 3.5 to 1. Under average conditions this car ought to make at least 65 miles per hour.

2—We do not advise making any changes whatever in the oiling system of the engine as it will be contrary to the principles of design that have been laid out by the engineers of the company.

DIFFICULT STEERING

Q—A 1916 Saxon car was damaged by fire making it necessary to put on new wheels. The new wheels were dished although the originals were straight. When driving at 20 m.p.h. in turning out for a stone, etc., the car is liable to go two or three feet to one side or the other of the road. In other words the turn seems to be made too quickly. We have given the wheels ⅜ in. gather. Instruct how to set.—Geo. E. Wheeler, Sioux Falls, So. Dak.

We do not believe that the wheels have anything to do with the trouble. The statement you have made with regard to dish and then following it with the expression gather leads us to believe that you refer to the camber of the wheels instead of the dish. If the action is fast when you first turn out it is a pretty good indication that you have not allowed enough play in the wheel.

If the action is correct when turning out but it is impossible to pull the car back quickly, there is a good indication of lost motion. There are so many parts in the steering apparatus that a small amount of play in each part, although you may think it is almost negligible, will result in poor steering action.

Examine the drag link to be sure that all of the play is eliminated. Then check up the king pins and bushings. Very often play in these parts will give a very violent whipping action at the wheel in addition to poor action. Jack up the car and work the wheel back and forth laterally.

If there is play it will show up immediately and it will be necessary to adjust the bearings. The toe in or gather should be from about ¼ in. to ⅜ in. This setting is made by adjusting the length of the knuckle tie rod, from one steering knuckle to the other. This adjustment should be made with the wheels on the ground.

The camber of the wheels which is for the purpose of making the steering easier should be about 2 deg. or about 1 3/16 in. for 34 in. wheels. Camber means that the wheels are closer together at the bottom than at the top.

This is usually done at the factory by tilting the steering knuckle, if not, then it can be done by bending the front axle between the spring seat and the steering knuckle yoke. The idea of cambering is to make the center line of the spindle bolt coincide as near as it is practical, to the center of contact of the tire with the road.

TO assist readers in obtaining as a unit all information on a certain subject, MOTOR AGE segregates inquiries in this department into divisions of allied nature. Questions pertaining to engines are answered under that head and so on.

Miscellaneous

Rob Hochquertil.....Peru, Ill.
L. L. Diehl.....Huntington, W. Va.
Walter Schroeder.....Woodstock, Ill.
Sam Zitazima.....Los Angeles, Calif.
Geo. E. Wheeler.....Sioux Falls, S. Dak.
Earl Ellithorpe.....Tulsa, Okla.
Dandis Shaw Smith.....Rochester, N. Y.

Carburetion

A. W. Tabin.....San Quentin, Calif.
John C. Mulford.....Washington, D. C.

Engines

Gilbert Lehnert.....Peotone, Ill.
D. T. Comter.....Raymond, O.
Oscar Shilts.....Gibson City, Ill.

The Electric System

H. C. Beckett.....Peoria, Ill.
F. R. Goodrich.....Detroit, Mich.
A. W. Tabin.....San Quentin, Calif.
John Realy.....Stafford Springs, Conn.
W. V. Henry.....San Jose, Calif.
F. O. Kennett.....Albers, Ill.

THERMAL EFFICIENCY

Q—What is meant by thermal efficiency and how is it figured for a gasoline engine?

2—What is the thermal efficiency of a Ford, a Franklin, and a Pierce-Arrow engine?

3—What is the mechanical efficiency of these same engines?—Landis Shaw Smith, Rochester, N. Y.

1—The thermal efficiency of an engine is the ratio of energy obtained from the heat units in the fuel to the actual number of units in the fuel. Another way to express thermal efficiency is that it is the ratio of the energy put in to the energy taken out, which after all is the way the efficiency of any machine is determined. A convenient way to represent this ratio would be as follows: Where the numerator of the fraction represents the energy utilized the denominator represents the energy availabl. We must assume that W represents the weight of the fuel per unit. C represents the specific heat of the fuel and the temperatures as T_1 and T_2. The equation becomes

$$\text{Efficiency} = \frac{WCT_1 - WCT_2}{WCT_1}$$

which reduces to the following form:

$$\text{Efficiency} = \frac{T_1 - T_2}{T_1}$$

The last equation means that the thermal efficiency of the engine can be found by substituting in the equation the absolute values of the maximum temperature within the combustion chamber at the time of explosion and the absolute temperature of the exhaust gases.

The equation as above written is not strictly applicable to an internal combustion engine but it gives an answer sufficiently close to be suitable for practical purposes.

As an illustration of the application of this formula, let us assume that the maximum temperature within the combustion of the engine is 2,000 deg. and the temperature of the exhaust gases 1,100 deg. Now since the absolute zero, which in Fahrenheit degrees is 459.7 below the zero we are all familiar with, it becomes necessary to add this amount to the temperature of the gases. They then become 2459.7 and 1559.7.

The thermal efficiency would then be:

$$E = \frac{2459.7 - 1559.7}{3459.7} = 0.261 \text{ or } 26.1 \text{ per cent.}$$

The temperatures which are used probably do not represent any one engine However, approximately these figures would apply to most motor car engines when running under full load and favorable conditions.

2—We are not able to give the information on the engines requested.

3—The mechanical efficiency of the engine is expressed as the ratio of the brake horsepower to the indicated horsepower. It is obvious that an engine will consume some of its power in operating its own functions, hence the mechanical efficiency when expressed in per cent will be higher than the thermal efficiency. This figure ranges from 70 per cent to 90 per cent in some cases. The subject of thermal and mechanical efficiency is involved and complicated and without long formulas it is difficult to properly discuss the subject. We refer you, therefore, to some standard treatises on the subject, such as Peabody on Thermodynamics or The Gas Engine by Hutton.

CORRECTION

In the July 29 issue of MOTOR AGE, a method for removing the pistons and connecting rods was outlined. This method is perfectly correct but we have been informed by the Hudson Motor Car Co., that the guarantee on a car is void if the compensating weights on the crankshaft are tampered with in any way.

Therefore, in order to comply with the conditions of the guarantee, the following method will have to be employed. It is possible to remove No. 3 and 4 pistons and connecting rods by simply dropping the oil pan, but to remove any of the others, the cylinder block itself must first be lifted and the connecting rods and pistons detached later.

CARBURETION

FUEL CONTROLLING DEVICES

Q—Explain minutely the workings of the "Fuel-izer" on the Packard and the "Hot-spot" and "Rams Horn" on the Chalmers.—A. W. Tabin, San Quentin, Cal.

The Fuelizer consists of a small supplementary carbureter and a burning chamber where the gas from the little carbureter is burned. This chamber is situated in the intake manifold. When the gas enters, it is ignited by a regulation spark plug, and passes into the fresh charging going from the carbureter to the cylinders. The heat of the burnt gas changes the wet, poorly carbureted mixture to a dry vapor, which explodes with full efficiency when it is touched off by the spark in the cylinder.

The action of the Fuelizer is entirely automatic, without involving a moving part. When the engine is starting the Fuelizer is in full operation, and the heat supplied to the charge becomes less as the throttle is opened. This regulation is provided by an air-valve similar in operation to the air-valve of the main carbureter. See Fig. 2.

The operation of the Fuelizer may be seen through a small Pyrex glass window. A perfect mixture produces a purple flame, a fairly rich mixture produces a bluish-green flame, and an exceedingly rich mixture is indicated by yellow streaks in the flame.

The "Rams Horn" to which you refer is a type of hot spot used on the Chalmers engine. Fig. 3 shows the general layout and the way in which the gas travels. The ideal manifold, if it were possible to construct it, would be short and straight. Probably the next best construction is a short manifold with easy curves.

The hot spot is an integral part of the inlet and exhaust manifolds. These manifolds join at the point where the exhaust gases from cylinders three and four enter the exhaust manifold. The incoming mixture from the carbureter is impelled against this heated surface and the heavy elements of the fuel are broken up into fine dry gas. The advantages claimed for the "Rams Horn" are as follows:

1. Forced contact with hot spot converts the mixture of gasoline and air into a fine dry vapor.

2. Feeds this perfectly blended gas in equal volume to all cylinders, at all engine speeds, because—(a) The gas passages are all of the same length; (b) It is as easy for the gas to get to one cylinder as to another.

3. Condensation is eliminated because—(a) Water jacketed space is encountered only at the extreme end; (b) There are no pockets in which gas can collect and stagnate, due to the easy air bends and short length of gas travel.

4. The danger of scored cylinder walls and pumping oil into the explosion chambers—as a result of thinning out the lubricating oil in the crankcase by the seepage of gasoline past the piston rings—is eliminated.

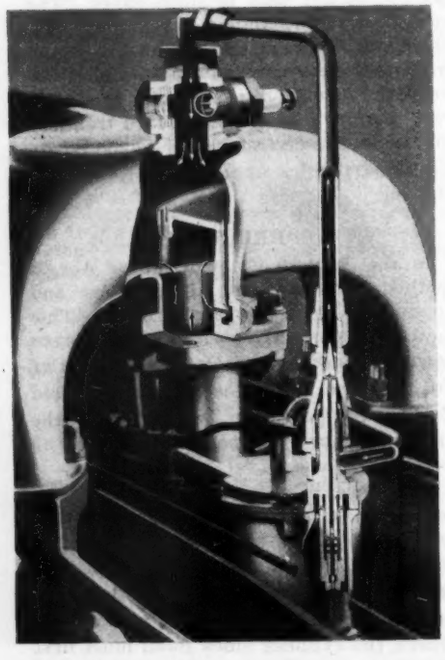


Fig. 2—Fuelizer used on Packard

ZENITH CARBURETER

Q—A 1916 Hupmobile, model N, is equipped with a Zenith carbureter which delivers about fifteen miles per gallon of gasoline. When new the car made about sixteen miles on a gallon. Has the Zenith carbureter been improved since that date and if so will the improved type deliver more miles per gallon?

Are other carbureters adaptable to this car and would they give better mileage than the figures quoted above and also make easier starting in cold weather with the low grade of gasoline now being sold?—John C. Mulford, Washington, D. C.

This condition is only natural. When the car was new everything was in good condition and it is probable that you drove it at the speed which would give the best mileage which is about twenty-two miles per hour. It must also be remembered that weather and road conditions have considerable effect on fuel consumption.

Furthermore, in order to obtain the absolute maximum mileage per gallon the car must be in perfect condition. Undoubtedly the valves need grinding and the carbon ought to be removed. As long as the car is operating satisfactorily we do not advise a change.

Carbureters have been improved since 1916 but we do not know whether it would be possible to obtain better mileage or not. We are not in a position to recommend any carbureter and as we have no records of tests conducted with the use of other carbureters it is impossible to answer the question.

It is always good policy to abide by the choice of the engineers who designed the car as they, undoubtedly, have conducted very thorough tests.

ENGINES

TIMING BOSCH DU-4

Q—A 1911 Cadillac has been built into a speedster and the engine has just been overhauled but the original speed cannot be secured. The engine seems to draw too much gas and does not have enough power on high gear. What is the trouble?

2—What is the correct valve timing of the 1911 Cadillac?

3—Instruct how to set a Bosch DU-4 magneto for high speed.—D. T. Comter, Raymond, Ohio.

1—Test the compression. It is very probable that in overhauling the engine a slip has been made in refitting the pistons and rings. If there is a great deal of condensation in the manifold so that it loads, it would prove very advantageous to install some type of hot-spot.

2—The intake valve opens 1 deg. after upper dead center and closes 38 deg. 26 min. after lower dead center. The exhaust opens 31 deg. 34 min. before bottom dead center and closes 7 deg. 17 min. after top dead center.

3—We advise using the standard setting as it will give you all the speed it is

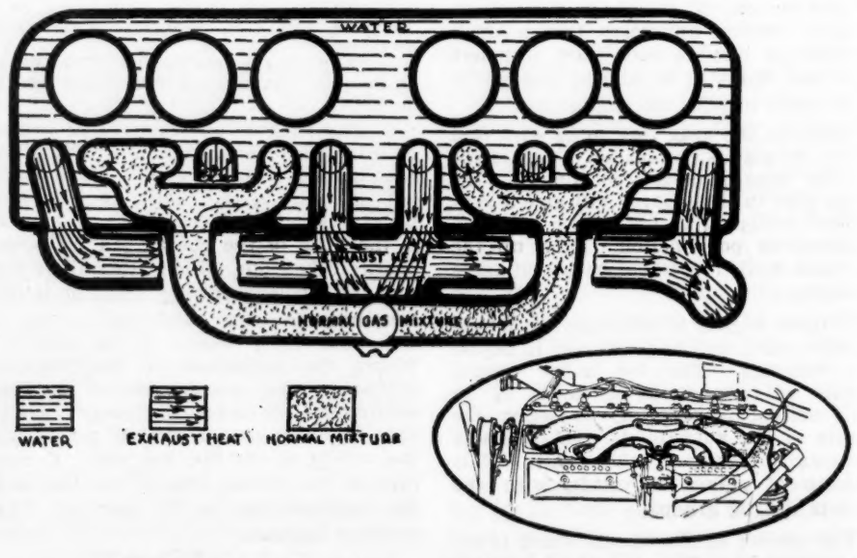


Fig. 3—"Rams Horn" hot spot used on Chalmers engine

possible to use. The setting is made as follows:

3—The crank shaft is rotated to bring No. 1 cylinder (in automobile practice this is the cylinder nearest the radiator) exactly on top dead center of the compression stroke, and the piston is to be maintained in that position. The magneto is then to be secured to its bracket or bed on the engine, and the timing control arm on the interrupter housing placed in the fully retarded position.

With that done, the magneto distributer plate should be removed by withdrawing the two holding screws, or depressing the two catch springs, as the case may be, thus exposing the distributer gear and brush. The cover of the magneto interrupter housing is also to be removed to permit observation of the interrupter.

The armature should then be rotated by means of the exposed distributer gear in the direction in which it is to be driven until the platinum interrupter contacts are just about to separate, which occurs when the interrupter lever begins to bear against one of the steel segments of the interrupter housing.

The armature should be held in that position while the magneto drive is connected to the engine, due care being taken that the piston of No. 1 cylinder is still exactly on top dead center of the compression stroke. The installation is completed by replacing the interrupter housing cover and distributer plate, and connecting the cables between the magneto and spark plugs.

The foregoing will establish the desired relationship between the magneto armature and the engine crank shaft. It should be noted, however, that while these instructions cover the average engine, the exact magneto timing for individual engines is best determined by trial. Where specific instructions for magneto timing are given by the engine manufacturers, it is recommended that such instructions be followed in preference to those given here.

OIL PUMPING

Q—A 1918 Oakland, model 34-B, equipped with lynite pistons pumps oil. The grade of oil used does not seem to make any difference or alter this condition in any way. The car has been run 7200 miles. Would you advise installing cast iron pistons and if so state where they can be obtained.—Gilbert Lehnert, Peotone, Ill.

Oil pumping by the pistons means, of course, that there is a considerable amount of wear which gives enough clearance to permit the oil to get by the rings. Remove the pistons and examine the rings for small portions which may not have had a bearing on the cylinder wall.

The rings at these points will show a discolored surface which is the result of the exploded gas flame burning them, and because the ring has no bearing on the cylinder wall it is not polished off through the friction of the rings on the wall. In addition to the wearing of the pistons and rings it is often found that the cylinders have worn out of round as well.

To determine whether the cylinder is out of round, measure its diameters from a number of different positions with a micrometer. If after accurately measuring then, it is found that there is a variation of more than .002 or .003 in. it can be taken for granted that unless the cylinders are reground and trued up no ring will give complete satisfaction.

We cannot state whether to install cast iron pistons or not and, therefore, you will have to use your own judgment. Aluminum pistons are successful and if you will refer to page 13 of the August 26 issue of MOTOR AGE, you will find an account of the performance of one type of aluminum piston.

If you do change to a cast iron piston we advise obtaining a piston of the lightest possible weight.

THE ELECTRICAL SYSTEM

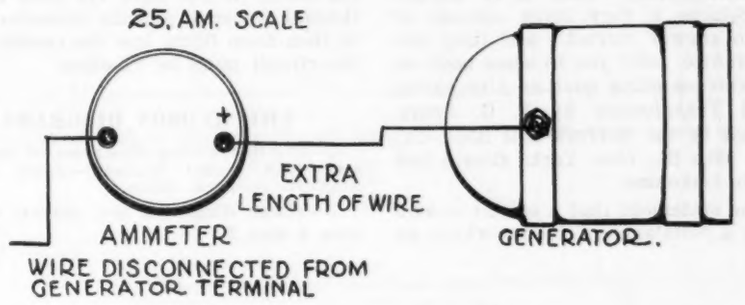


Fig. 4—Connection of ammeter between battery and generator on Ford

CHARGING RATE

Q—What should be the range of amperage of the generator on the 1920 Ford?—H. C. Beckett, Peoria, Ill.

The generator which is used as standard equipment on the Ford car is provided with third brush regulation and it is possible to vary the charging rate from eight to twelve amperes. When it is desired to change the maximum generator current, an ammeter should always be connected in the circuit between the battery and the generator. This can be easily done as shown in Fig. 4.

1916 CHALMERS WIRING DIAGRAM

Q—Publish wiring diagram for a Chalmers car 6-40, 32 B, 1916 model.—F. R. Goodrich, Detroit, Mich.

Wiring diagram of the Westinghouse system on the 1916 Chalmers is shown in Fig. 5.

TRANSFORMER FOR CUTTING TORCH

Q—Instruct how to build a "step up" transformer to step up the amperes to 500 amp. utilizing 110 volt electric light circuit regular amperage. This is to be as light and compact as possible and to be used with portable cutting torch.

2—Moreton and Hatch in "Electric Equipment of the Motor Car" page 20, line 16 says, "a circuit is said to have a resistance of 1 ohm where an electric pressure of 1 volt will produce a current in the circuit of 1 ampere." This looks like stagnation to me. Of course, I am wrong and Moreton and Hatch are correct but please explain.

3—What is the ratio of volts to ohms?—A. W. Tabin, San Quentin, Cal.

1—With 110 volts applied to the primary we believe the most suitable voltage for the secondary is about six. It must be remembered that it is quite difficult to handle 500 amperes, therefore great care must be taken in winding. The transformer will have a capacity of 3 kw. The figures which we will give are merely approximate and they may require some slight changes in order to get the most satisfactory operation. For the secondary you will want strands of ribbon copper 380 by 90 mills and we believe that about 1 volt per turn on the secondary, which would be six turns, will prove successful.

For the primary you will want about 17 turns of No. 8 copper wire B. S. gage. The capacity of this transformer will demand at least 3 sq. in. for core area. This transformer will be quite heavy and we believe that if a load of 500 amp. is

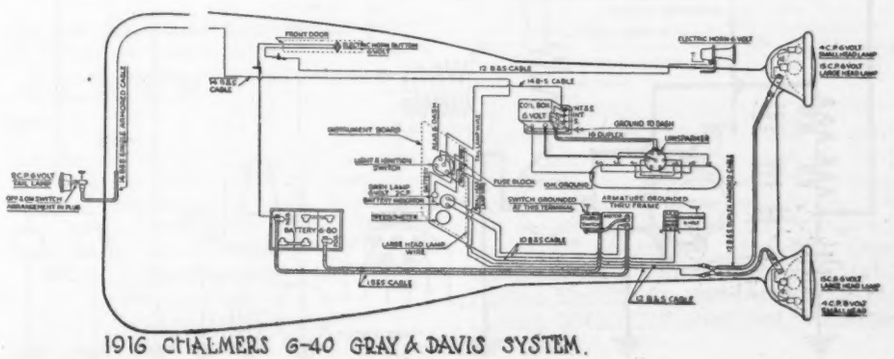


Fig. 5

to be drawn off continuously, oil will be needed to cool the transformer linings.

In spite of the fact that it is possible for you to build a very good transformer we believe that you would be better satisfied by purchasing a transformer to meet your requirements from a company that specializes in transformer design and manufacture. This is a subject that requires a very large amount of space to answer correctly and fully and we, therefore, refer you to some book on transformer winding such as Alternating Current Transformer by F. G. Baum, published by the McGraw-Hill Book Co., 239 W. 39th St., New York, should you decide to make one.

2—The statement that a circuit is said to have a resistance of 1 ohm where an electric pressure of 1 volt will produce a current of one ampere is absolutely correct and is about as simple as it is possible to state it. This is based on Ohms Law which is volts divided by amperes equals ohms and applies to direct current.

3—With two of the factors known the above formula can be applied to obtain the third. If you have 110 volts flowing through a circuit and the ammeter reads 10 then from Ohms law the resistance of the circuit must be 11 ohms.

TWO HUDSON DIAGRAMS

Q—Publish wiring diagrams of the 1920 and 1913 model Hudson.—John Realy, Stafford Springs, Conn.

1—These diagrams are shown in figures 6 and 7.

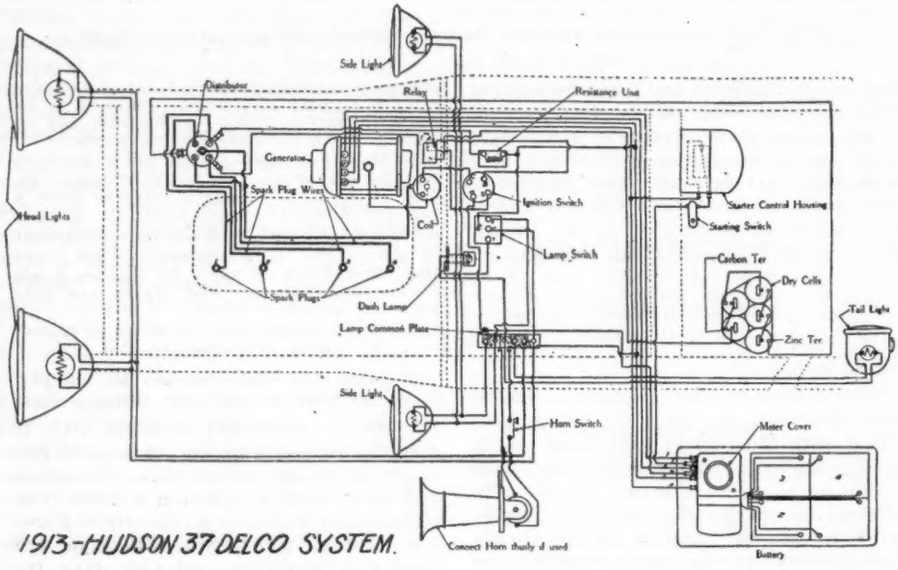


Fig. 6

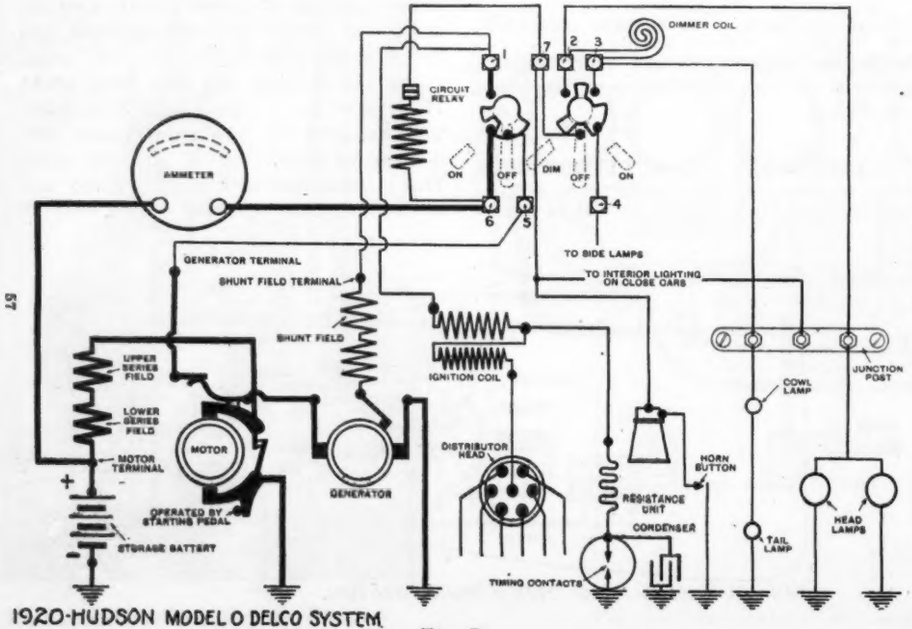


Fig. 7

APPARENT CANDLE POWER

Q—Explain the difference between the Atwater Kent 6-volt and 12-volt ignition coils.

2—What is the difference between the Bosch DU-4 and DU-6 armature windings?

3—What is meant by apparent candle power as used in the California headlight law?

4—What would be the effect of using 12-volts on a 6-volt starter?

5—Why are some generator armatures made with a relatively large number of small segments on commutator and others with fewer and larger?

6—Is there an electric scriber designed for marking tools?—W. V. Henry, San Jose, Calif.

1—We have no information concerning the construction of the two coils but it is very logical to assume that the construction is the same with the exception of wire size.

2—The armature windings will be the same but the construction of the distributer will be different.

3—The term apparent candle power which is used in the state law of California refers to a measurement of light obtained by calculation from the number of foot candles. Distance and candle-power have a direct bearing on the intensity of illumination. If the distance between the plane to be illuminated and the source remain the same, and the intensity of the source, or its candle power is changed, the intensity of the illumination, or the foot candles, will vary in the same proportion.

Candle-power is a unit of measurement, and is the ratio of the intensity of the light in question to the intensity of the light of one standard candle, in one direction only, and will be the same in any other infinite number of directions in space. Candle-power, then, is no indication of the quantity of light, but its intensity in any certain direction, regardless of its distance from the source. Illumination is the effect or result of light, and the unit for measuring illumination in the foot-candle.

A foot-candle represents an intensity of illumination equal to that produced at a point on a plane which is one foot distant from the source of light equivalent to one candle-power, and which is perpendicular to the ray of light at that point. If the candle power remains the same, but the distance between the source and the plane is doubled, the same quantity of light must cover four times as much surface, as shown in Fig. 8.

Then, the foot-candles vary directly as the candle power and inversely as the square of the distance between the source and the plane to be illuminated. To illustrate what is meant by the term apparent candle-power, assume an observer is 100 ft. in front of a car and 7 ft. to the left of it, which would be about the position of the eyes of the driver in an approaching car. Then determined on 0.08 foot-candles at the critical point according to the California law, the apparent candle-power would be 100 squared times 0.08 or 800.

4—If you continue to use twelve volts on a six volt Staring winding it is certain that it will burn out.

5—This is a question of design and since it is really out of our field we cannot give the space that it would require to answer the question.

6—We have no record of any instrument of this kind but information may be obtained by writing to some of the large electrical manufacturing companies like the Westinghouse Electric Mfg. Co., East Pittsburgh, Pa., and the General Electric Co., Schenectady, N. Y.

OLYMPIAN WIRING DIAGRAM

Q—Publish wiring diagram of 1917 Olympian touring car showing positive and negative wires.—F. O. Kennett, Albers, Ill.

1—The wiring diagram for this car is shown in Fig. —.

Engines

ADVANCED SPARK KNOCK

Q—A 1919 6-cylinder Haynes model 45, type T, produces a knock when spark is advanced in order to attain higher speed. The bearings seem to be in good condition. What causes the knock?

2—The highest speed that can be obtained by this car at the present time is 48 m.p.h. How fast should it go if the car were in good condition? What is the r.p.m. of the engine?

3—What is the fastest speed each of the following cars will make: Pilot 45, Reo, Auburn, Elgin, Huffman, Allen 43, Bour-Davis, Comet, Columbia, and Skelton?

4—Give a formula that can be used in determining the speed of a car when the gear ratio, r.p.m. of engine and size of wheel is given.

5—Give the names of a few cars and trucks using the Beaver 6-cylinder engine.—Oscar Shilts, Gibson City, Ill.

1—This knock which you hear is a result of advancing the spark too far. Advancing the spark will give a little more speed but it is unreasonable to think it will give you a much faster car. A possible explanation and one which has received some support, is that the charge in the cylinder detonates in much the same way that certain explosives do.

A piece of gun cotton, for instance, if laid on an anvil and lighted with a match, burns slightly, because it has all of the required space in which to expand, but if instead of its being lighted it is struck with a hammer, it will explode with a loud report. Now in the case of gas exploding or burning in the cylinder, if the piston is able to move away from it easily and thus give room for expansion, there is no knock, but if, as in the case we are discussing, the piston moves against the explosion, like the hammer falling on the gun cotton, the result is a knock.

2—This car ought to make a higher speed but it may be that this particular car will not.

In many cases, in spite of the fact that cars are built identical, there will be a wide variation in their speeds. As long as the car operates very satisfactory we advise leaving it just as it is. If you are judging the speed of the car by the speedometer reading there is a possibility that the speedometer is at fault. This engine develops 50 hp. at 2200 r.p.m.

3—We have no official figures from which we could quote the maximum speed and, therefore, our statement is merely an approximation. All of the cars ought to make from fifty to sixty miles per hour under average conditions.

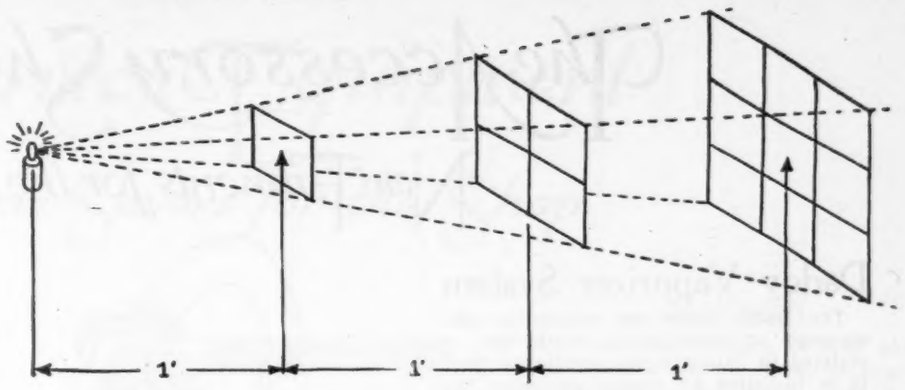


Fig. 8—Showing how the quantity of light on a surface varies inversely as the square of the distance

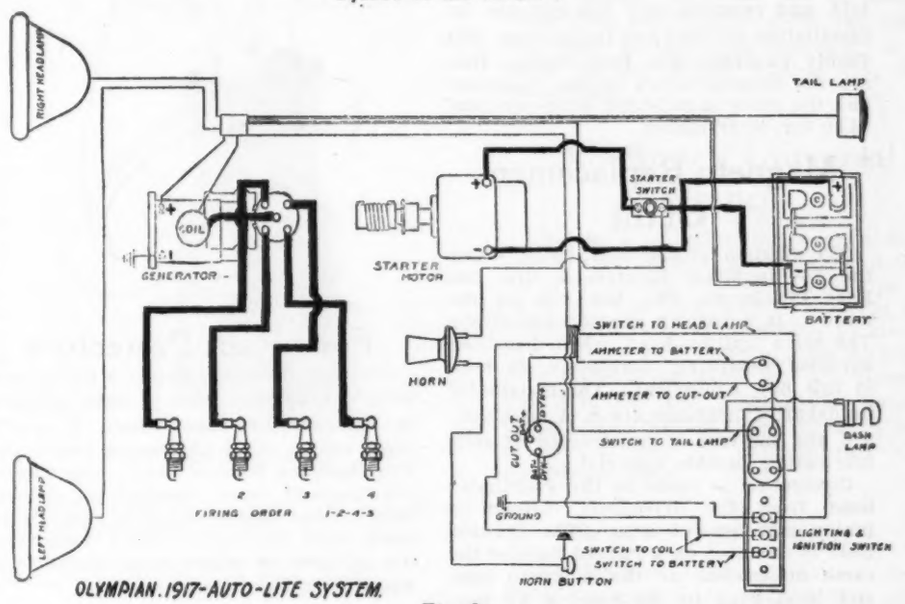


Fig. 9

4—The factors that enter into the computation of the possible speed of a car are the r.p.m. of the engine, the diameter of the wheel, and the gear ratio. For example: A car is traveling with a speed in miles per hour corresponding to an engine speed of 2400 r.p.m. It has a gear ratio of 4.5 to 1 and is equipped with 32 by 4 tires. What is the speed of car in miles per hour?

$$\frac{2400}{4.5} =$$

the number of revolutions the wheel makes at an engine speed of 2400 r.p.m.

$$\frac{32 \times 3 \times 3.1416}{12} =$$

the number of feet of travel in one revolution of the wheel and this multiplied by sixty equals the distance covered in one hour. Since there is 5280 ft. in a mile the formula becomes

$$\frac{2400 \times 32 \times 3.1416 \times 60}{4.5 \times 5280 \times 12}$$

50.5 m.p.h.

5—Of recent years the Beaver Manufacturing Co. has been concentrating on tractor engines exclusively and the Geneva Wagon Co., Geneva, N. Y., is the only company who equip their truck with a Beaver engine. However, the Beaver Mfg. Co. have just brought out two new engine models which marks their reentrance into the passenger car field. We have not yet been advised what cars will use these engines.

REPAIRING FLANDERS CAR

Q—The engine of a Flanders car, serial No. 75824, is in the best of condition, but the gear box and differential are too worn to repair or adjust. We have found the pinion, crown and the lay shaft the only things on the car that often break. Would you advise fitting a new type of transmission? We think the transmission used in an Overland 75-B would fit this car.—The Automobile Co., Trichinopoly, India.

If you change to the type of transmission used in the Overland it will mean that the rear axle assembly will have to be replaced anyway. We advise leaving the present construction as it is and purchasing parts for the rebuilding. These can be obtained from Auto Gear Company, 844 Eighth Avenue, New York; Puritan Machine Co., 409 Lafayette Blvd., Detroit, Mich.; The Boneyard, Washington, Iowa.

The Accessory Show Case

New Fitments for the Car

Daddy Vaporizer System

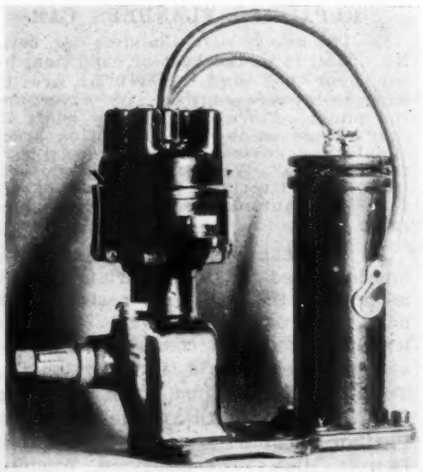
The Daddy vaporizer system is constructed of monel-metal cloth and is claimed to vaporize any condensed fuel. It is installed by simply removing the intake from the cylinder block, inserting the vaporizer and putting back the manifold, and requires only ten minutes for installation on Ford and Dodge cars. The Daddy Vaporizer Co., Fort Wayne, Ind., are the manufacturers of this vaporizer, and the price is $3.50 for Ford cars and $4.50 for other makes.

Magneto Replacement Outfit

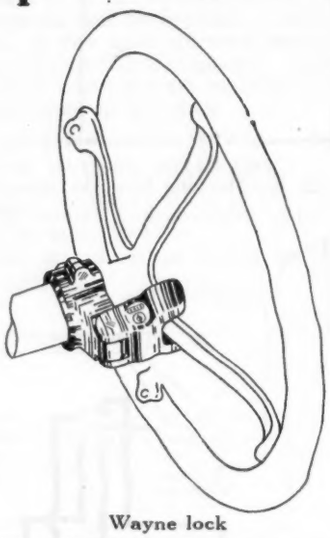
The magneto replacement outfit, which the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has put on the market, is a battery ignition substitute. The same ignition head, which has been supplied separately heretofore, is used in this new equipment. The distributer headshaft dimensions are S. A. E. standard and the cam is constructed of self-lubricating durable material.

Connection is made to the distributer head from the driveshaft through a pinion and beveled gear. The ignition head is mounted on a rugged base of the same dimensions as the magneto base and is secured to the bracket by four screws corresponding to the magneto support. The process of magneto replacement with this device consists in unscrewing the magneto from its support, placing the outfit in position, resetting the screws and coupling, making connections and timing.

This condenser is claimed to be indestructible under service conditions and the circuit breaker contacts operate 10,000 miles under normal conditions without adjustments.



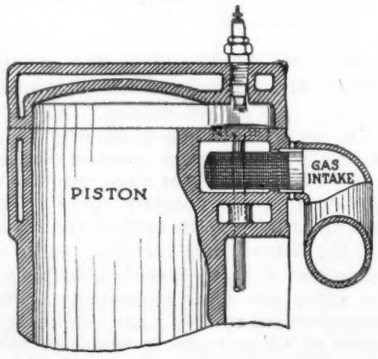
Magneto replacement outfit



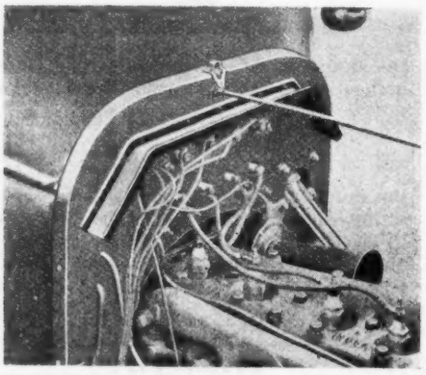
Wayne lock

Ford Rain Protectors

Many Ford drivers during a heavy rain have had the experience of water seeping in through the hood where it would short circuit the high tension terminals. The Highway Rubber Corp., 1009 Chestnut street, St. Louis, manufacture a small hard rubber shield which is screwed in place over the high tension terminals, the purpose of which is to deflect the water from the wires.



Daddy vaporizer system



Ford rain protectors

Wayne Lock

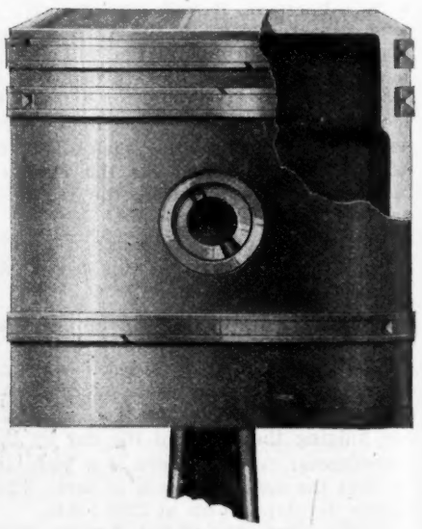
The Wayne Lock is a device claimed to be thief-proof. The steering mechanism is immovably locked by raising the fork up to engage one of the spokes and it unlocks as simply as a spring cylinder door lock. It is claimed the lock cannot be drilled, filed or broken, being made from case hardened drop forgings, heavily nickled. Its position on the steering post is an added feature. This lock is manufactured by the Fort Wayne Auto Specialty Co., Fort Wayne, Ind., and sells for $12.

V-Plex Piston Ring

The V-Plex Piston Ring is constructed of three pieces. The two side or pressure rings have one side cut at an angle and when placed in the piston groove are opposed to one another and form a V-shaped opening into which the third or center ring is placed. This center ring is of a V-shaped cross-section and is merely a spacer which, in actual work, forces the pressure rings against the side of the groove, thus filling the groove.

The three parts of the V-Plex ring are placed with the gap or open ends one-third apart and around the periphery so that two solid sections of the ring oppose the gap in the third section, thus virtually there is no gap.

Being placed in the groove as above the two pressure rings have their open ends or gaps, one-third of the periphery apart, and the ring is claimed to exert an even pressure against the cylinder wall. It is manufactured by Krasberg Piston Ring Works, 536 Lake Shore Drive, Chicago.



V-Plex piston ring

Service Equipment
Time Savers for the Shop

Bench Drilling Stand

This stand, which is made by the Black & Decker Mfg. Co., 1436 S. Michigan Avenue, Chicago, is designed especially for its 3-8, 1-2, 9-16, 5-8 and 7-8 electric drills. Four holes are provided in the base for fastening it to the bench, and the vertical column being a solid steel shaft 1 7-16 in. in diameter makes the stand firm and rigid.

The bracket carrying drill can be raised or lowered on the vertical column and secured in any desired position by means of a split collar and clamping screw. The drill may be swung clear of the base, which makes it possible to use the stand for such work as applying ring gears to axles, drilling in the ends of shafts, and other work too high to be drilled on the bench. Both vertical and horizontal adjustments are secured by means of the clamping screw. The stand without the portable electric drill sells for $50.

Universal Engine Stand

This stand is for all sizes or makes of car and truck engines, both three-point and four-point suspension, and is easily adjustable to any size of motor. The worm and worm-wheel drive make it possible to place the motor in any required position. It is substantially made of angle iron, well riveted, and the side members are supported with cast iron brackets. Four casters permit it to be moved to any desired position and two lock screws to elevate corners make the stand rigid when in use. It is made by the Fairbanks Co., Chicago.

Chauffeur's universal wrench

Gimlet bit sets

Gimlet Bit Sets

This convenient outfit for a woodworker's bench consists of twelve bits, ranging from 1-32 to 12-32 in. Each bit is made of steel, hand forged, properly tempered and sharpened by hand. Goodell-Pratt Co., Greenfield, Mass., sells the outfit complete for $2.80.

SlaPatch

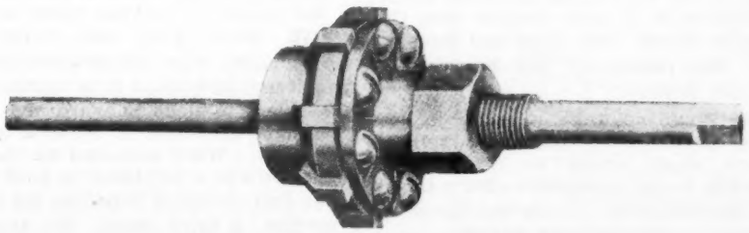
The particular feature of this patch is the four winds or flaps, making it adjustable in 3, 3½, 4, 4½, and 5 in. casings. It is said to be quickly and easily applied with the use of special tools, does not move or shift, and holds the edges of the tread securely. It is made by the Wilson Rubber Co., Des Moines, Ia.

Chauffeur's Universal Wrench

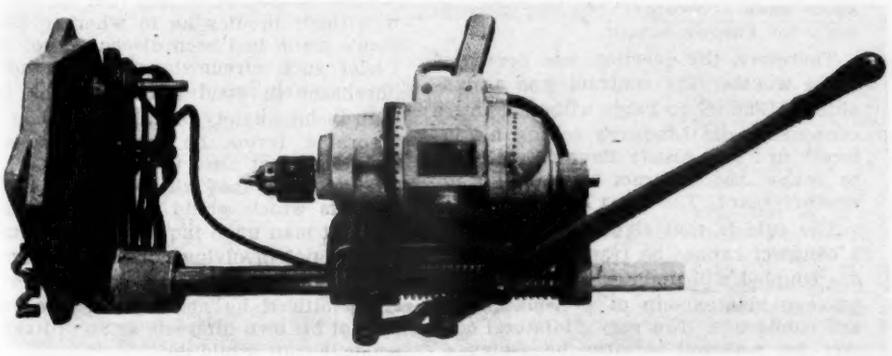
This is a self-adjusting wrench suitable for any size square or hexagon nut up to ⅝ in., and will hold round pipe up to ½ in. The jaws open by pressing the trigger and close automatically by means of a spring. It is made of steel with the jaws properly hardened, and it is claimed will grip any size piece within its capacity. The wrench sells for $2.50 and is the product of Goodell-Pratt Co., Greenfield, Mass.

Valve Seat Facer

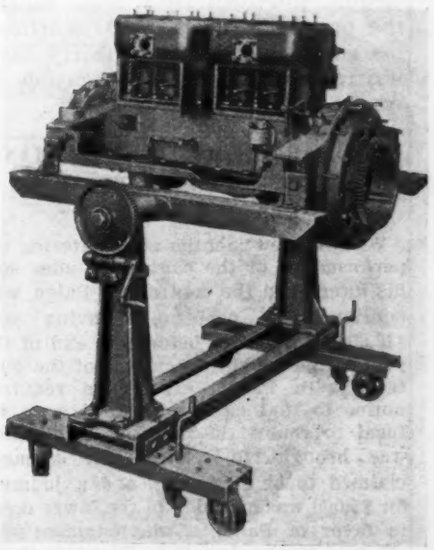
The Hoener Adjustable Valve Seat Facer includes 5-16, 3-8 and 7-16 pilot stems, and a longer set of cutters for larger valves. The cutters are made of tool steel, properly tempered, and it is claimed are as strong and accurate as a solid facer. The pilot stems are interchangeable and will fit any size valve accurately. It is manufactured by the Hoener Adjustable Valve Seat Facer Co., 3929 Moneta Ave., Los Angeles, and sells for $12.



Hoener adjustable valve seat facer



Bench drilling stand



Universal engine stand

Law in Your Business

By Wellington Gustin

Court Holds Manufacturer Need Not Renew Contract of Exclusive Agency

Personal Credit and Confidence Not Transferable —Services Not Assignable Without Consent

A CONTRACT of exclusive sales agency is involved in the recent decision of the New York Court of Appeals in the action of H. Ray Paige against Alexander Faure. The facts appear to be that Faure, for a period of one year, gave to Paige and Lindner the exclusive agency in the United States, except the cities of New York and Boston, to sell automobile tires manufactured by and for him and bearing his name.

He agreed to sell the tires and make prompt delivery to Paige and Linder at the prices charged him for their manufacture by the B. F. Goodrich Co., or any other manufacturer, plus $2 profit on each. They also agreed to purchase $1,000.00 worth of tires at once and thereafter carry and sell the stock during existence of any contract between the parties; he agreeing to renew the contract from year to year at their option, provided they sold, during the previous year $10,000 worth of his goods and gave him thirty days' written notice of an intention to renew.

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such indiivdual inquiries on knotty problems as may be submitted to him.

ACTION BROUGHT AGAINST MANUFACTURER UPON REFUSAL TO RENEW CONTRACT

Within a few months after entering the performance of the contract Linder sold his interest in the contract to Paige, who continued to perform. Having sold $10,000 of the tires before the end of the year Paige sought a renewal of the contract with Faure, giving the required notice to that effect. Upon Faure's refusal to renew the contract this action was brought to recover the damages claimed to be sustained, and a judment for $5,000 was awarded in the lower court in favor of Paige. This judgment was affirmed in the Appellate Division of the New York Supreme Court, but same has been reversed by the Court of Appeals.

This latter court said there was no provision in the contract to the effect that the sales agents were to devote their time and use their best endeavors to further the interest of Faure, but in view of the credit and exclusive agency given them it is fairly implied that they were to devote their time and do whatever was reasonable and necessary to sell the product.

One would not take, if acting in good faith, an exclusive agency to sell another's goods unless he expected and intended to use reasonable efforts to sell. The manufacturer, during the life of the contract could not sell his own goods except in the territory reserved, and the sales agents became obligated accordingly for Faure's benefit.

Therefore, the question was presented as to whether the contract was assignable by Lindner to Paige without Faure's consent, or did Lindner's selling his interest to Paige justify Faure in refusing to renew the contract with Paige for another year? The court held that it did.

The rule is that rights arising out of a contract cannot be transferred if they are coupled with liabilities or if they involve a relationship of personal credit and confidence. Nor may a bilateral contract for personal services be assigned by either party to it, without the consent of the other.

It was explained that the rules here stated do not apply because there was a provision in the contract that it should "bring and benefit the respective successors and assigns of the parties thereto." The court points out that the intention of parties to a contract must be ascertained, not from one provision but from the whole agreement. When thus considered it was apparent that both Paige and Lindner were personally to devote their time to carrying out its terms, the language showing that a personal trust and confidence was reposed in both of them. Therefore, it was such a contract for personal services that could not be assigned.

Claim on Car Held Valid Against Third Party Who Has Actual Knowledge of Claim

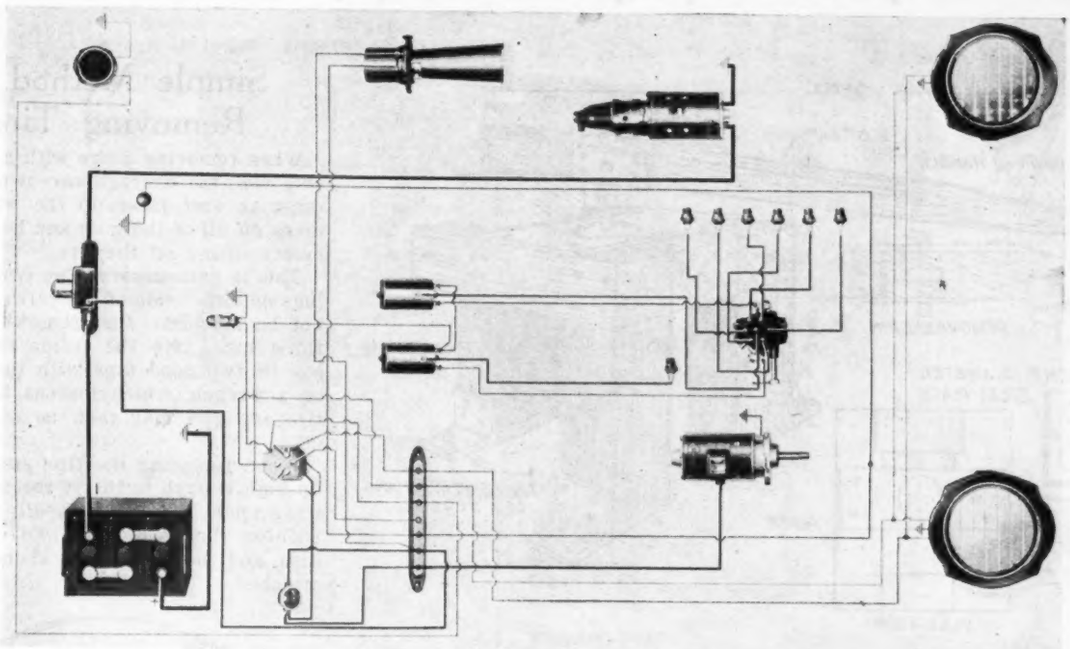
THAT a lien or claim upon a motor car is valid against third parties, though such lien is not a matter of public record, where such third party has actual knowledge or notice of the existence of such claim, is a recent decision of the Supreme Court of Michigan in the case of Rossman vs. Ward.

The facts show that Ward saw an advertisement offering a car for sale. He was told by the garage keeper of Rossman's claim on the car, and was referred to the latter for terms of purchase. Ward was unable to arrange terms with Rossman. Later Ward was offered the car by another who had obtained possession of it and had taken it to another garage. A sale was made to Ward and Rossman brought an action of replevin to recover the car. Ward defended on the ground that he was a purchaser in good faith and the lien claims of Rossman did not apply to him, a third party. He says he did not know whether this third party owned the car or not, admitting that he bought it without inquiry as to whether Rossman's claim had been discharged or not. Under such circumstances he is not a purchaser in good faith, and the fact that, in his anxiety to acquire the car on favorable terms he forgot Rossman's claim does not alter the situation.

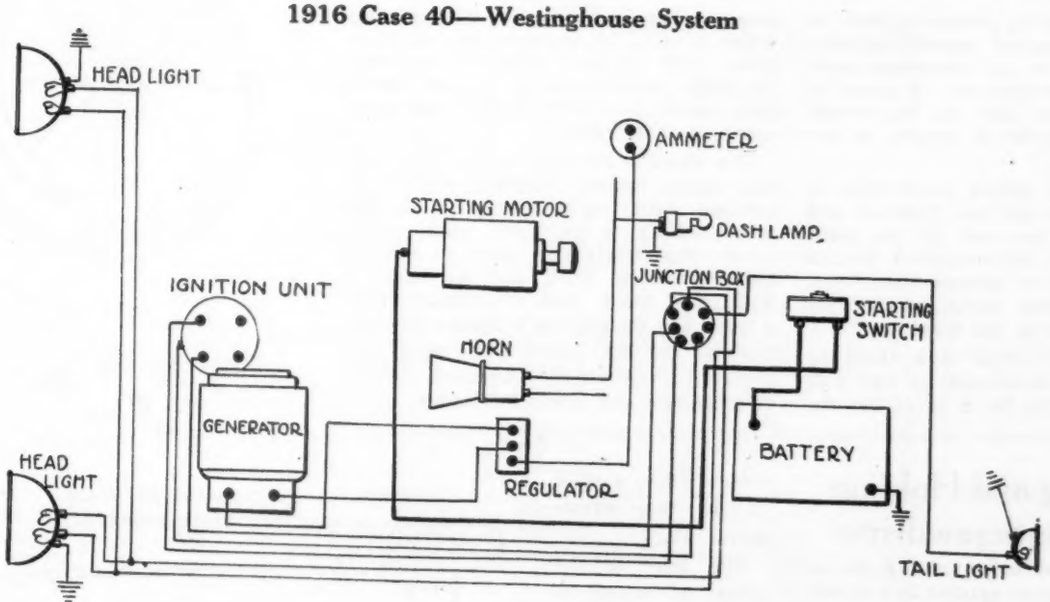
The rule is that where one has notice of facts which would put an ordinarily prudent man upon inquiry, (in all transactions not involving commercial paper) he cannot be considered a purchaser in good faith if he neglects to take such care of his own interests as an ordinarily prudent man would do.

Motor Age Weekly Wiring Chart No. 98

Wiring Diagram of New Packard Single Six Announced Last Week



1916 Case 40—Westinghouse System

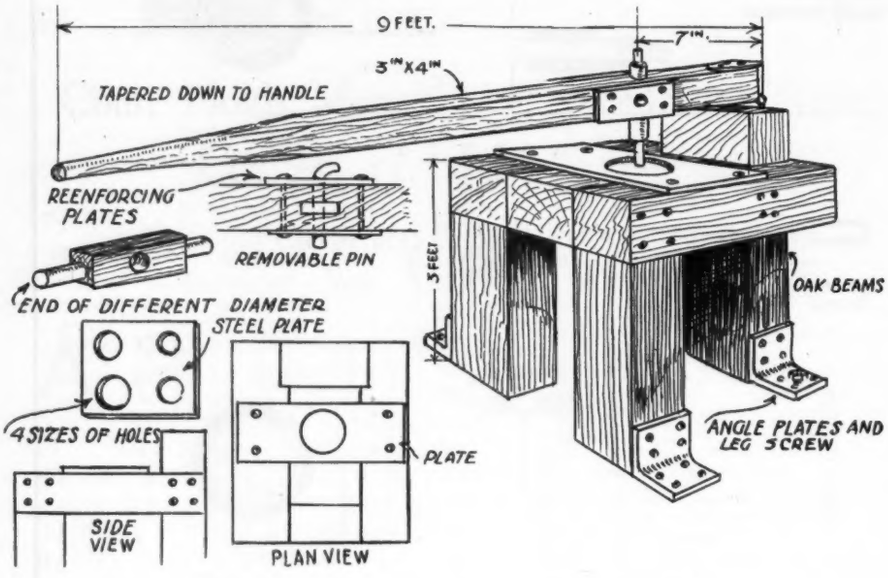


Name of car and date on which wiring diagrams have appeared in previous issues

Allen—June 17, '20
Sept. 30, '20
Apperson—Aug. 5, '20
Auburn—Sept. 9, '20
Briscoe—May 6, '20
Buick—July 15, '20
Case—Aug. 5, '20
Chalmers—June 17, '20
Chandler—May 20, '20
Cole—June 10, '20
Crow-Elkhart—July 29, '20
Davis—Aug. 12, '20
Sept. 2, '20
Dort—Aug. 12, '20
Dodge—Sept. 23, '20
Elcar—May 6, '20
Franklin—June 3, '20
General Battery Charging—Sept. 13, '19
General Magneto Diagram—June 15, '19
Grant—Aug. 12, '20
Harroun—July 15, '20
Haynes—June 24, '20
Internal Connections—July 10-17-24, '19
Jeffery—May 13, '20
Jordan—June 10, 20
July 22, '20
King—May 20, '20
Kissell—May 27, '20
Aug. 19, '20
Lexington—July 29, '20
Locomobile—June 3, '20
Moline-Knight—May 20, '20
July 22, '20
Moon—July 29, '20
Aug. 19, '20
Sept. 2, '20
Oldsmobile—Sept. 16, '20
Peerless—May 13, '20
Pierce-Arrow—July 15, '20
Reo—July 22, '20
Roamer—Aug. 5, '20
Sept. 30, '20
Saxon—Sept. 9, '20
Scripps-Booth—Aug. 26, '20
Stephens—Sept. 16, '20
Studebaker—July 1, '20
Stutz—July 8, '20
Special Systems for Fords—May 15-22, '19

The Automotive Repair Shop

Practical Maintenance Hints



Details of a Shop Made Press

In a small shop or garage a press of two or three thousand pounds capacity is heavy enough for the numerous small jobs that are encountered. A press of this capacity that can be improvised from scrap material, is shown in the appended sketch.

This is of the direct lever type in which a pressure of one hundred and fifty pounds on the end of the lever results in twenty-four hundred pounds at the lever bar by making the length of the lever sixteen times the distance from the fulcrum to the lever bar.

The bar of the press is a three by four inch beam reinforced by two side plates, these acting as a pivot for the pressure bar. A heavy gate type of strap hinge is used as the fulcrum. A steel plate with several sizes of reducing bushings takes care of various sized parts to be fitted with or have bushings removed from them.

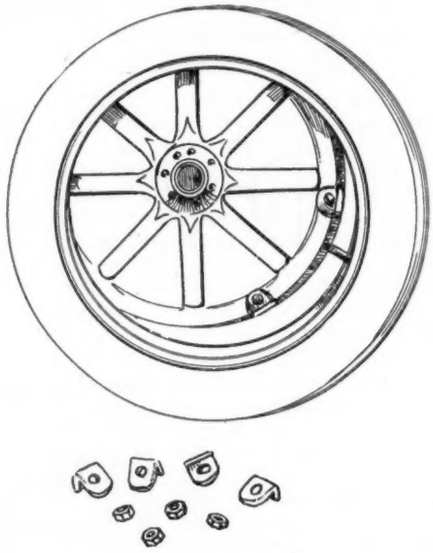
The stand is built up solidly from oak and rigidly braced. Angular straps are secured with lag screws to hold the press solidly to the floor when being used. Practically any piece of car or truck overhaul work may be handled with this press, and everything from a wrist pin bushing to a spring shackle bushing can be forced home with the pressure of twenty-four hundred pounds or more that this press will apply.

Simple Method of Removing Tires

When removing a tire with a demountable rim, the average car owner or garageman first jacks up the wheel, then takes off all of the nuts and holding lugs before lifting off the tire.

This is unnecessary. The two nuts and lugs on either side of the valve stem need not be touched. Just remove the other three lugs, give the inside of the rim one or two good taps with the tire tool or a wrench, which loosens it, and the tire and rim may then be easily lifted off.

When replacing the tire, simply lift it up high enough to insert the valve stem, whereupon it will naturally fall into position between the two untouched lugs, and the other three should then be attached.

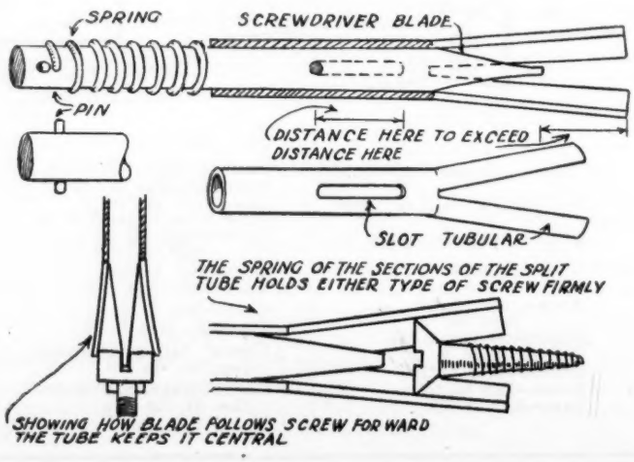


Centering and Holding Device for Screwdriver

The illustration below shows an attachment that can be applied to a screwdriver and serves the double purpose of holding the screw and centering the blade with the slot. This consists of a cylindrical section of pipe with cross slots and the ends sprung outward. A spring behind this part pushes it forward while a cross pin prevents it or limits its movement.

A second pin holds the spring compressed against the slotted cylindrical part. The tubular part is best made of a springy piece of brass tubing of a diameter to make a snug fit on the screwdriver blade.

The head of the screw is placed in this, slightly forcing the ends apart. This permits of placing the screw into inaccessible parts. When the handle is pressed forward the blade is brought into ailgnment with the slot as the handle is turned.


SPRING
SCREWDRIVER BLADE
PIN
DISTANCE HERE TO EXCEED DISTANCE HERE
SLOT TUBULAR
THE SPRING OF THE SECTIONS OF THE SPLIT TUBE HOLDS EITHER TYPE OF SCREW FIRMLY
SHOWING HOW BLADE FOLLOWS SCREW FOR WARD THE TUBE KEEPS IT CENTRAL

Shackle Bolt Sizes for 1920 Cars

Motor Age Maintenance Data Sheet No. 117

One of a series of weekly pages of information valuable to service men and dealers—save this page

Make of Car—Model	Front Length	Front Diameter	Rear Length	Rear Diameter
Allen, 43	3 1/8	1/2	3 1/8	1/2
American Six, C-60	3 1/4	3/4	3 1/4	3/4
American Beauty, —	3 3/4	1/2	4 1/4	5/8
Anderson, S-30	4	5/8	4	5/8
Apperson, 8-20-S. 8-209	3 5/16	5/8	4 9/16	7/8 & 5/8
Auburn, 6-39	3 9/16	5/8	3 3/4	5/8
Bour-Davis, 21-S-F-R	3 7/8	5/8	4 1/4	3/4
Briscoe, 4-34				
Buick, 1921	3 9/16	7/8	4 3/8	9/16
Case, V	3 5/8	3/4	4	3/4 & 7/8
Chalmers, 35-C	4	1/2	4 5/16	3/4
Chandler, 27	3 5/8	5/8	3 5/8	5/8
Chevrolet, FB	9/16		3 31/64	
Cleveland, 40	3 7/16	5/8	3 1/4	5/8
Climber, S-1920	3 5/8	5/8	3 5/8	5/8–3/4
Cole, 870	4 1/16	5/8	4 1/16 & 4 5/8	5/8 & 3/4
Columbia	3 1/2	.560	4 13/32	.560
Comet				
Commonwealth, 45	2	5/8	2	5/8
Crawford				
Crow-Elkhart				
Cunningham, V4, 132 & 14r U. B.	4 13/16	5/8	4 13/16	5/8
Daniels, D	3 7/16	5/8	4 1/8	11/16
Davis				
Dodge, Touring Car	3 11/16	1/2	3 11/16	1/2
Dort, 15	4 3/32	1/2x20	4 1/32	5/8x18
Dixie Flyer, H	3 3/16	1/2	3 15/16	1/2
Dorris, 6-80	2 1/4	.625	2 1/4	.625
Douglas				
DuPont, A	3 5/8	.625	4 15/16 & 4 1/16	7/8 & 5/8
Elcar, 21	3 13/16	3/4	4 3/16	3/4
Elgin, K	4 1/8	3/4	4 3/8 & 4 7/8	3/4
Essex, A	3 13/16	.623	3 15/16	.623
Economy				
Ferris, C-20	3 21/32	3/4	3 3/4x3 3/4	7/8 & 3/4
Franklin, S-9-B	2 31/32	3/4		
Ford, T				
Gardner, G				
Geronimo, 6-A-45	3 1/16	9/16	3 1/16–3 1/4	9/16–3/4
Grant, DC-6	2 1/2	3/4	3	1 & 3/4
Hanson				
Harroun				
Haynes	2 1/4	3/4	2 1/4	1 & 3/4
H. C. S.				
Hollier				
Holmes, S-3	1 3/4	3/4	1 3/4	3/4
Hudson, 11-O	4 5/32	.6855	4 3/4	.748
Huffman, R	3 7/8	5/8	3 7/8	5/8
Hupmobile				
Jordan, M	3 1/2	5/8	6 5/32	7/8
King, H	3 1/8	5/8	2 5/8	5/8
Kissel				
Klinekar, K	3 5/8	3/4	3 5/8	3/4
LaFayette, 134	3 7/8	7/8	4 1/8	7/8
Leach-Biltwell				
Lexington, S	3 3/16	5/8	3 5/8	3/4
Liberty, 10C	2 1/2	9/16	2 27/32 & 3 11/16	9/16 & 3/4
Lincoln				
Locomobile				
Lorraine, 20T	3 1/8	1/2	3 1/8–3 1/2	1/2–3/4
Maibohm				
Marmon, 34B	3 17/32	.560	4 1/32	.560
Marshall				
Maxwell, 25	4 3/32	.557	3 15/16	.747
McFarlan, 147	4 1/8–4 3/8	4 3/4–3/4	5 5/8	1
Mercer, S-5	4 9/16	.998–.001	4 13/16x4 9/16	.998–.0011
Metz, Master 6	2 13/16	5/8	2 1/2x3	3/4x5/8
Mitchell, F-40	3 5/16	9/16	3 13/16	9/16
Monitor				
Moon, 6-48-20	3 3/4	5/8	4 1/4	5/8x3 3/4
Monroe, Brush	3 9/16	9/16	3 13/16	9/16
Meteor, R-RR	3 1/2	5/8	3 5/8	5/8
Nash, 68-1-2-4, 5-6-7	3 7/8	.622	4 13/16	.747
National, S-BB				
Nelson, E	2 3/4	1/2	3 1/2	5/8
Noma, C	4	11/16	4	11/16
Norwalk				
Oakland, 34-C	3 7/16	5/8	3 7/16	5/8
Ogren, 6-60	4	5/8	4 1/8	5
45B	5	3/4	4 1/2	3/4
Oldsmobile, 379	4 3/4	3/4	4 1/2	3/4
Olympian, 45	2 7/8	.625	3 13/16	.625
Overland, 4	3 1/2	9/16	3 1/2	9/16
Owen Magnetic, 60				
Packard, 3-35	3 53/64	5/8	4 9/16	5/8
Paige, 6-42	3 15/16	5/8	5 1/4	3/4
Paterson				
Peerless, 56-S6	3 1/16	1/2	3 1/16	1/2
Phianna				
Piedmont, 4-30	3 3/4	3/4	3 3/8	3/4
Pierce Arrow, 31	3 7/8	.687	3 7/8	.687
51	3 7/8	.687	4 1/8	.687
Pilot, 6-45	3/4	1/2	3 1/2	1/2
Porter, 46	Special	3/4	3 3/16	3/4
Premier, 6-D	4 1/16	5/8	4 1/16–4 5/8	5/8–3/4
Reo, T-6	4 1/8	.622	3 15/16	.622
Revere, C-D	3 13/16	5/8	3 13/16	5/8
Roamer				
R. & V. Knight	3 1/2	5/8	3 3/4	5/8
Saxon				
Sayers				
Scripps-Booth, B-39	4 1/16	3/4	4 1/2 & 4 1/2	3/4
Seneca, L-20	3 3/8	1/2	6	3/4
Severin				
Singer				
Skelton, 35	4	5/8	4	5/8
Spacke				
Standard				
Stearns, SK-I4	4 3/8	5/8	4 3/8 & 4 11/16	5/8 & 5/8
Stevens-Duryea				
Stephens, 80	3 5/8	5/8	4 1/16 & 3 5/8	3/4–5/8
Studebaker, E. J.	3 3/4	9/16	4	9/16
Studebaker, E. H.	3 3/4	9/16	4	9/16
Studebaker, E. G	3 3/4	9/16	4	9/16
Stutz				
Templar, 445	3 17/32	7/8	3 25/32	7/8
Texan, A & B-38	3 1/4	1/2	3 3/4	1/2
Tulsa				
Velie, 34	3 1/32	.6225		
Velie, 48	3 13/16	.745		
Wasp, 2011	4 1/2	3/4	5	3/4
Westcott, C38	3 3/4	5/8	3 3/4 & 4 5/8	5/8 & 3/4
Westcott, C48	3 3/4	5/8	4 5/16 & 4 5/8	5/8 & 3/4
Willys-Knight				
Winther, 61	3 15/16	5/8	3 15/16	5/8
Winton, 25	4	3/4	4	3/4

Motor Age Monthly Passenger Car Specification Tables

These prices apply to five and seven-passenger models only.

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Size and Make	Gear Ratio	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	LampVoltages	Name and Model
Ace T. L.	5	2050	115	32x4	Firestone	3½x5	H-S	6	25.35	1½—Strom.	4.50	Detlaff	Warner	Detroit	Spacke	Gemmer	Stewart	Firestone	6	170	U. S. L.	A-L	A-L	A-K	6	Ace T. L
Allen 43		1595	110	32x4	Miller	3½x5	Own	4	19 60	1—Strom.	4.60	B. and B.	Own	Detroit	Columbia	Own	.....	Stanweld	6	95	U. S. L.	West.	West	Conn.	6	Allen 43
American C	5	2295	127	32x4	.....	3½x5	H-S	6	25.35	1½—Strom.	4.50	B. and B.	Warner	Hart	Salisbury	Warner	V. Sicklen	Firestone	6-8	100	Willard	G & D.	G. & D.	Conn.	6-8	American C
American Beauty	5	2450	121	33x4	Firestone	3½x5	H-S	6	25.35	1½—Ray.	4.90	B. and B.	Detroit	Acme	Timken	C. A. S.	Warner	Firestone	6	110	Willard	West.	West.	West.	6	American Beauty
Anderson Series 30	5	2145	120	33x4	Goodrich	3½x4½	Cont.	6	25.35	Ray.	4 50	B. and B.	Durston	Ther-H	Salisbury	Jacox	Stewart	Firestone	6	111	Willard	Remy	Remy	Remy	6	Anderson Series 30
Apperson Anniversary	7	4250	130	34x4½	U. S.	3½x5	Own	8	33 80	1½—John.	4.25	Own	Own	Sterling	Own	Own	V. Sicklen	Firestone	6	110	Willard	Bijur	Bijur	Remy	6	Apperson Anniversary
Apperson 8-20	7	3500	130	34x4½	Goodyear	3½x5	Own	8	33 80	1½—John.	4.25	Own	Own	Sterling	Own	Own	V. Sicklen	Firestone	6	110	Willard	Bijur	Bijur	Remy	6	Apperson 8-20
Auburn 6-39	5	1895	120	33x4	Goodrich	3½x4½	Cont.	6	25.35	1—Ray.	4.66	B. and B.	G-L	Hartford	Col.	Jacox	Stewart	Firestone	6	80	Willard	Remy	Remy	Remy	6	Auburn 6-39
Beggs 6	5	2150	120	33x4	Goodrich	3½x4½	Cont.	6	25.35	1—Strom.	.....	B. and B.	Detroit	Arvac.	Stan-Par	Ditweiler	Stewart	Firestone	6	100	Exide	A-L	A-L	Conn.	6	Beggs 6
Bell	5	1495	114	31x4	Miller	3½x4½	H-S	4	22 50	1—Strom.	.....	.....	Muncie	Hart	Peru	Warner	Stewart	Firestone	6	.....	Prest.	West.	West.	A-K	6	Bell
Bour-Davis 21 S.	7	2585	126	33x4½	Goodyear	3½x5½	Cont	6	29.40	1½—Zen.	4.50	Muncie	Muncie	Spicer	Salisbury	Lavine	Stewart	Firestone	6	115	Willard	West.	West.	West.	6	Bour-Davis 21 S. & R.
Brewster	4	9000	125	34x4½	Kelly-S	4x5½	Own	4	25.60	1½—Strom.	4.50	Own	Own	Own	Own	Own	Stewart	Firestone	12	80	U. S. L.	U. S. L.	U. S. L.	Berl.	.....	Brewster
Briscoe 4-34	5	1285	109	31x4	optional	3½x5	Own	4	18.23	1—	4.18	Own	Own	Own	Own	Own	Stewart	Hayes	6	80	Prest.	A-L	A-L	Conn.	6	Briscoe 4-34
*Buick 21-45	5	1795	118	33x4	Goodyear	3½x4½	Own	6	27.34	—Mar.	4.00	Own	Own	.....	Own	Own	A-C	Own	6	80	Willard	Delco	Delco	Delco	6-8	Buick 21-45
*Buick 21-49	7	2065	124	34x4½	Goodyear	3½x4½	Own	6	27.34	—Mar.	4.00	Own	Own	.....	Own	Own	A-C	Own	6	80	Willard	Delco	Delco	Delco	6-8	Buick 21-49
Cadillac 59	7	3940	132	35x5	optional	3½x5½	Own	8	31.25	1½—Own*	5.07	Own	Own	Spicer	C-Timk.	Own	V. Sicklen	Kelsey	6	.....	Exide	Delco	Delco	Delco	6-3	Cadillac 59
Case V	7	2650	126	34x4½	Goodyear	3½x5½	Cont.	6	29.40	1½—Ray.	4.45	B. and B.	G-L	Peters	Col.	Jacox	V. Sicklen	Firestone	6	118	Willard	West.	West.	Delco	6	Case V
Chalmers 35-C	5	1945	117	32x4	optional	3½x4½	Own	6	25.35	.....	.....	Own	Own	.....	.....	Own	.....	.....	6	106	.....	.....	.....	.....	6	Chalmers 35-C
Chalmers 35-B	7	2095	122	33x4½	optional	3½x4½	Own	6	25.35	.....	.....	Own	Own	.....	.....	Own	.....	.....	6	106	.....	.....	.....	.....	6	Chalmers 35-B
Champion C-4	5	1350	116	32x3½	Goodrich	3½x5	Lyco	4	19.60	1—Zen.	4.25	B. and B.	G-L	.....	Peru	C. A. S.	Stewart	Stanweld	6	80	Willard	Delco	Delco	Delco	6	Champion C-4
Champion S-4	5	1550	118	32x4	Goodrich	3½x5	H-S	4	19.60	1—Zen.	4.25	B. and B.	G-L	.....	Peru	C. A. S.	V. Sicklen	Stanweld	6	80	Prest.	Dyn.	Dyn.	A-K	6	Champion S-4
Chandler	7	1895	123	33x4	Goodrich	3½x5	Own	6	29.40	1½—Ray.	4.40	B. and B.	Own	Hartford	Own	Gemmer	Stewart	Firestone	6	105	Prest.	G. & D.	G. & D.	Bosch	6	Chandler
Chevrolet 4-90	5	795	102	31x4	Goodyear	3½x4	Own	4	21.76	1½—Zen. ♯	3.63	Own	Own	Own	Own	Warner	Stewart	Perl-Jack.	6	80	Willard	A-L	A-L	Simms	6	Chevrolet 4-90
Chevrolet F. B.	5	1295	110	33x4	Goodyear	3½x5½	Own	4	27.10	1½—Zen.	4.62	Own	Warner	Own	Own	Warner	Stewart	Perl-Jack.	6-8	105	Willard	A-L	A-L	Simms	6	Chevrolet F. B.
Cleveland 40	5	1435	112	32x4	Goodrich	3x4½	Own	6	21.60	1—Strom.	4.45	B. and B.	Mechanics	Mechanics	Own	Ditweiler	V. Sicklen	Firestone	6	94	Prest.	G. & D.	G. & D.	Bosch	6	Cleveland 40
Climber 4	5	1650	117	33x4	Goodyear	3½x5	H-S	4	19.60	—Strom.	4.80	B. and B.	B-L	Hartford	Adams	Warner	V. Sicklen	Jacox	6	80	Willard	West.	West.	A-K	6	Climber 4
Climber 6	7	2750	120	32x4½	Goodyear	3½x5	H-S	6	25. 35	—Strom.	4.75	B. and B.	B-L	Hartford	Timken	Warner	V. Sicklen	Firestone	6	120	Willard	West.	West.	Bosch	6	Climber 6
Cole Aero Eight 870	7	3250	127	33x5	Firestone	3½x4½	North.	8	39.20	1½—John.	4.45	North.	North.	Spicer	Col.	Gemmer	Warner	Firestone	6	125	Willard	Delco	Delco	Delco	6	Cole Aero Eight 870
Columbia C	5	1995	115	32x4	Firestone	3½x4½	Cont.	6	25.35	1½—Strom.	4.75	B. and B.	Durston	Spicer	Timken	Gemmer	Stewart	Firestone	6	105	Prest.	A-L	A-L	A-K	6	Columbia C
Comet C-53	5	2350	125	33x4½	Firestone	3½x5½	Cont.	6	29.40	1½—Strom.	4.66	B. and B.	Muncie	Arvac	Col.	Gemmer	Stewart	Firestone	6	120	Willard	Wagner	Wagner	Wagner	6	Comet C-53
Commonwealth 4-40	5	1595	117	32x4	Goodrich	3½x5	H-S	4	19.60	1—Carter	4.25	B. and B.	Muncie	Detroit	Peru	C. A. S.	V. Sicklen	Stanweld	6	105	Prest.	Dyn.	Dyn.	A-K	6	Commonwealth 4-40
Craig-Hunt	5	....	103	30x3½	.....	3½x4	Own	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Conn.	....	....	....	Craig-Hunt
Crawford 20-6-40	7	3000	122½	32x4	.....	3½x5½	Cont.	6	29.40	—Strom.	4.22	B-L	B-L	Sterling	Timken	Gemmer	Stewart	Firestone	6	110	Willard	West.	West.	Bosch	6	Crawford 20-6-40
Crow-Elkhart L-55-4.	5	1295	117	32x3½	Firestone	3½x5	Lyco.	4	19.60	⅞—Zen.	4.25	B. and B.	Covert	Ther-H	Peru	Ditweiler	Stewart	Firestone	6	80	Exide	Dyn.	Dyn.	Conn.	6	Crow-Elkhart L-55-4
Crow-Elkhart H-55-6.	5	1545	117	33x4	Firestone	3½x5	Ruten.	6	23.4	—Zen.	4.25	B. and B.	Covert	Ther-H	Peru	Ditweiler	Stewart	Firestone	6	80	Exide	Dyn.	Dyn.	Conn.	6	Crow-Elkhart H-55-6
Cunningham V-4	7	....	142	35x5	optional	3½x5	Own	8	45.00	1½—Strom.	4.08	B-L	Own	Snead	Timken	Gemmer	Warner	Firestone	6	120	Willard	Delco	Delco	Delco	6	Cunningham V-4
Daniels D.	7	4850	132	34x4½	optional	3½x5½	Own	8	39.20	1½—Zen.	4.40	Own	Own	Spicer	Timken	Gemmer	Stewart	Firestone	6	145	Willard	Delco	Delco	Delco	6	Daniels D
Davis 51	5	2185	120	33x4	Goodrich	3½x4½	Cont.	6	25.35	1½—Strom.	4.75	B. and B.	Warner	Peters	Timken	Warner	Stewart	Firestone	6	80	Willard	Delco	Delco	Delco	6	Davis 51
Dixie Flyer H-S-70	5	1595	112	32x4	Fisk	3½x5	H-S	4	19.60	1—Strom.	4.72	B. and B.	G-L	Ther H	Peru	C. A. S.	V. Sicklen	Standard	6	80	Willard	Dyn.	Dyn.	Eise.	6	Dixie Flyer H-S-70
Dodge Brothers	5	1280	114	32x3½	optional	3½x4½	Own	4	24.03	1½—Stew.	4.16	Own	Own	Own	Own	Own	J. Man.	Kelsey	12	50	Willard	N. E.	.....	Own	12	Dodge Brothers
Dorris 6-80	7	4785	132	33x5	Goodyear	4x5	Own	6	38.40	1½—Strom.	3.50	Warner	Warner	Spicer	Timken	Ross	V. Sicklen	Firestone	6	130	Willard	West.	West.	Bosch	6	Dorris 6-80
Dort 15	5	1035	105½	30x3½	Goodyear	3½x5	D-Lyco	4	19.60	1—Carter	4.07	Own	Mechanics	Mechanics	Flint	Jacox	Stewart	Cleveland	6	95	U. S. L.	West.	West.	Conn.	6	Dort 15
du Pont A	5	4000	124	32x4½	Goodrich	3½x5½	Own	4	24.75	1½—Swan	4.45	B-L	B-L	Spicer	Col.	Jacox	Warner	Firestone	6	105	Exide	West.	West.	Eise.	6	du Pont A
Economy 6-46	5	1895	115	33x4	Goodrich	3½x4½	Cont.	6	25.35	1—Zen.	4.50	B. and B.	Durston	Norwalk	Salisbury	Ditweiler	Stewart	Firestone	6	90	Willard	A-L	A-L	Conn.	6	Economy 6-46
Elcar 6	5	1795	116	33x4	Firestone	3½x4½	Cont.	6	25.35	1½—Strom.	4.50	B. and B.	Muncie	Peters	Salisbury	C. A. S.	Stewart	Stanweld	6	90	Willard	Delco	Delco	Delco	6	Elcar 6
Elcar 4	5	1495	116	33x4	Firestone	3½x5	Lyco.	4	19.60	1—Strom.	4.50	B. and B.	Muncie	Peters	Salisbury	C. A. S.	Stewart	Stanweld	6	90	Willard	Delco	Delco	Delco	6	Elcar 4

Engines—Ruten., Rutenber; Cont., Continental; Weid., Weidely; North., Northway; H-S., Herschell-Spillman; Lyco., Lycoming; D-Lyco., Dort-Lycoming; G. B. & S., Golden, Belknap & Swartz; T-McTeetor-McFarlan; ♯, Monson or Duesenberg; R. & V., Root & Van Dervoort. **Carburetor**—Strom., Stromberg; Zen., Zenith; Ray., Rayfield; John., Johnson; Mar., Marvel; Sund., Sunderman; Stew. Stewart; H-K., Holley-Kingston; Newc., Newcomb; Scheb., Schebler; Tillot., Tillotson; Johns., Johnston. Fuel feed vacuum except where otherwise indicated. *Pressure. ♯Gravity. **Generator and Motor**—A-L., Auto-Lite; West., Westinghouse; ♯, Westinghouse or Auto-Lite; W-L., Ward-Leonard; Dyn., Dyneto; N. E., North East; L-N., Leece-Neville; A-C., Allis-Chalmers; Split., Splitdorf; S-H., Simms-Huff; G. & D., Gray & Davis. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; Eise., Eisemann; West., Westinghouse; Will., Willard; N. E., North East; K-Remy, Kingston-Remy; Berl., Berling; Bosch-W., Bosch-Westinghouse; Split., Splitdorf. **Gearset**—G-L., Grant-Lees; North., Northway; B-L., Brown-Lipe. **Rear Axle**—Col., Columbia; W-Weiss, Walker-Weiss; C-Timk., Cadillac-Timken; West-Mott, Weston-Mott. **Universals**—Hart., Hartford; Ther-H. Thermoid-Hardy; U. M. Co., Universal Machine Co. **Speedometer**—J-Man., Johns-Manville; V-Sicklen, Van Sicklen; A-C., Allis-Chalmers; *, 1921 Model.

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Size and Make	Gear Ratio	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Elgin Series K	5	1575	118	33x4	optional	3½x4½	Falls	6	23.44	1—Strom.	5.09	B. and B.	Mechanics	Mechanics	Col.	C. A. S.	V. Sicklen	Firestone	6	90	Willard	Wagner	Wagner	Wagner	6	Elgin Series K
Essex A	5	1595	108½	32x4	optional	3½x5	Own	4	18.23	1½—Own	5.09	Own	Own	Spicer	Timken	Gemmer	Stewart	Kelsey	6	105	Exide	Delco	Delco	Delco	6	Essex A
Fergus	6	....	126	32x4	.....	3½x5	.....	6	25.35	—Zen.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Bijur	Bijur	Delco	.....	Fergus
Ferris C-20	6	3675	130	32x4½	Firestone	3½x5½	Cont.	6	29.40	—Zen.	.....	B. and B.	G-L	Peters	Col.	Gemmer	Warner	Firestone	6	120	Willard	L-N	-N	L-N	6	Ferris C-20
Fiat	7	....	136	35x5	.....	.....	Own	6	.....	—Own	4.75	.....	Own	Own	Own	Own	Stewart	.....	12	60	Own	Own	Own	Marelli	.....	Fiat
Ford T	5	440	100	30x3½	.....	3¾x4	Own	4	22.50	1—H-K♯	3.63	Own	Own	Own	Own	Own	.....	.....	6	80	opt.	Own	Own	Own	6	Ford T
Franklin 9-B	5	600	115	32x4	Goodyear	3½x4	Own	6	25.35	1—Own	4.33	B. and B.	Own	Own	Own	Own	Stewart	.....	12	60	Willard	Dyn.	.....	A-K	12	Franklin 9-B
Gardner	5	1285	112	32x3½	Goodyear	3½x5	Lyc.	4	19.60	1—Carter	.....	B. and B.	Mechanics	Peters	W-Weiss	Ditweiler	Stewart	Jaxon	6	87	Willard	West.	West.	West.	15	Gardner
Geronimo	5	1995	122	32x4	Goodyear	3½x5	Ruten.	6	23.44	1—Strom.	4.5	B. and B.	G-L	Hart	Flint E	C. A. S.	Stewart	Firestone	6	88	Exide	Dyn.	Dyn.	Delco	6	Geronimo
Grant H-X	5	1750	116	32x4	optional	3½x4½	Walker	6	22.52	1—Strom.	4.63	B. and B.	Durston	Spicer	Columbia	Jacox	V. Sicklen	Firestone	6	105	Prest.	Bijur	Bijur	Bosch	6	Grant H-X
Handley-Knight	7	....	125	32x4½	.....	4½x4½	Knight	4	27.23	1½—Till.	4.45	B. and B.	G-L	Ther-H	Timken	Gemmer	V. Sicklen	Firestone	6	.....	U. S. L.	A-L	A-L	Conn.	.....	Handley-Knight
Hanson 54-A	5	2365	121	32x4	optional	3½x4½	Cont.	6	25.35	1½—Mar.	.....	B. and B.	Detroit	Detroit	Timken	Gemmer	Stewart	Kelsey	6	80	Prest.	Delco	Delco	Delco	6-8	Hanson 54 A
Harroun A-A-2	5	1195	106	30x3½	Miller	3½x5½	Own	4	16.90	1—Strom.	4.00	Own	G-L	Own	Adams	Lavine	Stewart	Stanweld	6	80	Prest.	Remy	Remy	Remy	6	Harroun A-A-2
Harvard	2		108	30x3½	Goodrich	3½x5	H-S	4	19.60	1½—Zen.	4.50	B. and B.	G-L	Detroit	Peru	Ditweiler	Stewart	Stanweld	6	120	Presto	Dyn.	Dyn.	A-K	6	Harvard
Hatfield A-42	5	1695	115	32x4	Firestone	3½x5	H-S	4	16.90	1—Zen.	.....	B. and B.	G-L	Spicer	Col.	.....	Stewart	Firestone	6	.....	Willard	Dyn.	Dyn.	Conn.	6	Hatfield A-42
Haynes 48	7	3635	132	34x4½	optional	2½x5	Own	12	36.30	1½—Ray.	4.12	B. and B.	Own	Arvac	Own	Jacox	Warner	Houk	6	120	Willard	L-N	L-N	Delco	6	Haynes 48
Haynes 47	7	2935	132	34x4½	optional	3½x5	Own	6	29.40	1½—Ray.	4.77	B. and B.	Own	Arvac	Own	Jacox	Stewart	Firestone	6	120	Willard	L-N	L-N	King	6	Haynes 47
H. C. S.	4	2975	120	32x4½	Goodrich	3½x5½	Weid	4	21.03	—Strom.	.....	.....	.....	.....	Own	Gemmer	.....	.....	6	.....	.....	Delco	Delco	Delco	.....	H. C. S.
Hollier 206-B	5	1985	120	33x4	Goodrich	3½x4½	Cont.	6	25.35	1—Zen.	4.41	Fuller	Fuller	Own	Own	Warner	Stewart	Firestone	6	80	U. S. L.	West.	West.	West.	6	Hollier 206-B
Holmes	7	3350	126	34x4½	Goodyear	3½x4½	Own	6	29.40	1—Newc.	4.90	B-L	B-L	Spicer	Timken	Gemmer	V. Sicklen	Firestone	12	80	Willard	Dyn.	Dyn.	Eise.	12	Holmes
Hudson O	7	2400	125	34x4½	optional	3½x5	Own	6	29.40	1½—Own	4.45	Own	Own	Spicer	Timken	Gemmer	Stewart	Kelsey	6	105	Exide	Delco	Delco	Delco	6	Hudson O
Huffman R	5	1995	120	32x4	Firestone	3½x5	H-S	6	25.35	.....	4.50	B. and B.	Covert	Flexite	Salisbury	Ditweiler	Stewart	Firestone	6	80	Willard	Dyn.	Dyn.	Conn.	6	Huffman R
Hupmobile R	5	1685	112	32x4	Goodyear	3½x5½	Own	4	16.90	1 —Strom.	4.87	Own	Own	Detroit	Own	Jacox	.....	Kelsey	6	90	Willard	West.	West.	A-K	6	Hupmobile R
Jackson 6-38	5	....	121	33x4	Goodyear	3½x4½	Cont.	6	25.35	1½—Strom.	.....	B and B.	Covert	Detroit	Salisbury	Own	Stewart	Jaxon	6	94	U. S. L.	A-L	A-L	Remy	6	Jackson 6-38
Jacquet, Flyer	5	....	124	33x5	Firestone	4½x6	Wis.	4	28.90	1½—Zen.	.....	Warner	.....	Snead	Timken	Gemmer	Waltham	.....	6	130	Exide	Bijur	Bijur	Berl	6	Jacquet, Flyer
Jones 28	7	2750	126	32x4½	Goodrich	3½x5½	Cont.	6	29.40	1½—Ray.	4.50	B. and B.	G-L	Arvac	Stan-Par	C. A. S.	Stewart	Hayes	6	120	Prest.	A-L	A-L	A-L	6	Jones 28
Jordan F	7	3050	127	32x4½	Goodyear	3½x5½	Cont.	6	29.40	1½—Strom.	4.08	Detroit	Detroit	Spicer	Timken	Gemmer	V. Sicklen	Firestone	6	118	Willard	Delco	Delco	Delco	6	Jordan F
Jordan M	5	2850	120	32x4	Goodyear	3½x4½	Cont.	6	25.35	1½—Strom.	4.66	Detroit	Detroit	Spicer	Timken	Gemmer	V. Sicklen	Firestone	6	94	Willard	Delco	Delco	Delco	6	Jordan M
Kenworthy 4-80	7	5000	130	32x4½	optional	4 x6	Duesen.	4	25.60	1½— Strom.	4.08	B-L	B-L	Ther-H	Col.	Ross.	Stewart	.....	6	140	Exide	Bijur	Bijur	Bosch	6	Kenworthy 4-80
Kenworthy 6-55	5	4250	130	32x4½	optional	3½x5½	Cont.	6	29.40	—Strom.	4.08	B-Lipe	B-Lipe	Ther-H	Col.	Ross	Warner	.....	6	140	Exide	Bijur	Bijur	Bosch	6	Kenworthy 6-55
King H	7	2835	120	32x4½	optional	3x5	Own	8	28.80	1½—Ball	4.08	Detroit	Own	Ther-H	Col.	Jacox	V. Sicklen	Standard	6	120	Prest.	West.	West.	.....	6	King H
Kissel	7	3475	124	32x4½	Goodyear	3¾x5½	Own	6	26.75	1½—Strom.	4.25	Warner	Warner	Spicer	Own	Jacox	Stewart	Firestone	6	120	Willard	Remy	Remy	Remy	6	Kissel
Klinekar 6-55	5-7	2265	121	33x4	Goodyear	3½x4½	Cont.	6	25.35	1½—Ray.	4.50	B. and B.	G-L	Flexite	Standard	Wohlrab	Stewart	Firestone	6	90	Prest.	Wagner	Wagner	Conn.	6	Klinekar 6-55-K
LaFayette	7	....	132	33x5	Firestone	3½x5½	Own	8	33.80	2—Own*	.....	Own	Own	Own	Own	Own	Waltham	Firestone	6	.....	Exide	Delco	Delco	Delco	6-8	LaFayette
Leach 20-A	5	5200	126½	32x4½	Goodyear	3½x5½	Cont.	6	29.40	—Ray.	4.50	B-L	B-L	Spicer	Standard	Liberty	.....	.....	6	180	Prest.	Delco	Delco	Delco	6-8	Leach 20-A
Lexington 8 K	5	2285	122	32x4	optional	3½x4½	Cont.	6	25.35	1½—Ray.	4.62	B. and B.	Warner	Hardy	Own	C. A. S.	Stewart	Kelsey	6	100	Willard	G-D	G-D	Conn.	6	Lexington 8
Liberty 10-C	5	1985	117	32x4	Goodyear	3½x5	Own	6	23.44	1—Strom.	4.66	B. and B.	Detroit	Spicer	Timken	Gemmer	Stewart	Firestone	6	90	Willard	Wagner	Wagner	Wagner	6	Liberty 10-C
Lincoln	7	4600	130	33x5	.....	3½x5	.....	8	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Delco	.....	.....	.....	Lincoln
Locomobile 48	7	8900	142	35x5	optional	4½x5½	Own	6	48.60	1½—Own*	3.80	Own	Own	Own	Own	Own	Stewart	Firestone	6	140	Exide	West.	West.	Berl.	6	Locomobile 48
Lorraine	5	1575	114	32x4	Republic	3½x5	H-S	4	19.60	1—John.	4.75	B. and B.	G-L	Acme	Standard	Gemmer	Stewart	Stanweld	6	94	U. S. L.	West.	West.	West.	6	Lorraine
Maibohm B	5	1595	116	32x4	Fisk	3½x4½	Falls	6	23.44	1—Till.	4.50	B. and B.	Muncie	Flexite	Peru	Bucyrus	Stewart	Stanweld	6	94	Willard	Bijur	Bijur	A-K	6	Maibohm B
Marmon 34	7	5000	136	32x4½	optional	3¾x5½	Own	6	33.75	1½—Strom.♯	3.75	Own	Own	Spicer	Own	Own	V. Sicklen	Stanweld	6	162	Willard	Delco	Delco	Delco	6	Marmon 34
Marshall K	5	1295	117	32x3½	Firestone	3½x5	Lyco.	4	19.60	1—Zen.	.....	B. and B.	G-L	Spicer	Peru	Gemmer	Stewart	Firestone	6	160	Willard	Dyn.	Dyn.	Delco	6	Marshall K
Maxwell 25	5	1155	109	30x3½	.....	3½x4½	Own	4	21.03	1—.....	.....	Own	Own	Own	Own	Own	Stewart	.....	6	87½	.....	.....	.....	.....	6	Maxwell 25
McFarland 147	7	6300	140	35x5	Goodrich	4½x6	Own	6	48.60	—Ray.	3.50	B. and B.	B-L	Peters	Timken	Gemmer	Stewart	Firestone	6	120	Willard	West.	West.	Berl.	6	McFarland 147
Mercer Series 5	6	4950	132	32x4½	optional	33/4x63/4	Own	4	22.50	1½—Ball	3.60	Own	Own	Spicer	Own	Gemmer	Warner	Firestone	6	182	Willard	West.	West.	Eise.	6	Mercer Series 5
Meteor K R	4	5500	129	32x4½	optional	4x6	Duesen.	4	25.60	1½—Zen.	4.41	B. and B.	Own	.....	Standard	Gemmer	Warner	.....	6	....	Willard	Bijur	Bijur	Simms	6	Meteor K R
Metz Master 6	5	1995	120	32x4	Goodrich	3½x5	Ruten.	6	23.44	1—Strom.	4.63	B. and B.	B-L	Hart	Timken	Own	Stewart	Firestone	6	110	Willard	G-D	G-D	Conn.	6	Metz Master 6
Mitchell F-40	5	1750	120	33x4	.....	3½x5	Own	6	25.35	1½—Ray.	4.41	B. and B.	Own	Own	Own	Own	Stewart	Stanweld	6	90	Willard	Remy	Remy	Remy	6	Mitchell F-40
Monitor M. & Ser. 3	5	2475	121	33x4	Miller	3½x4½	Cont.	6	25.35	1—Strom.	.....	B. and B.	G-L	.....	Stan-Par.	C. A. S.	Stewart	Stanweld	6	110	Prest.	Dyn.	Dyn.	Conn.	6	Monitor M. & Ser. 3
Monroe S-9	5	1440	115	32x3½	Goodyear	3½x4½	Own	4	16.90	1⅛—Zen.	4.50	Own	Muncie	Universal	Own	C. A. S.	Stewart	Firestone	6	80	U. S. L.	A-L	A-L	Conn.	6	Monroe S-9
Moon 6-48	5	2385	122	32x4	Miller	3½x4½	Cont.	6	25.35	1½—Ray.	4.66	B. and B.	B-L	Spicer	Timken	Warner	Stewart	Firestone	6	110	Exide	Delco	Delco	Delco	6	Moon 6-48

Engines—Ruten., Rutenber; Cont., Continental; Weid., Weidely; North., Northway; H-S., Herschell-Spillman; Lyco , Lycoming; D-Lyco., Dort-Lycoming; G. B. & S., Golden, Belknap & Swartz; T-McTeetor-McFarlan; ♯, Monson or Duesenberg; R. & V., Root & Van Dervoort. **Carburetor**—Strom., Stromberg; Zen., Zenith; Ray., Rayfield; John., Johnson; Mar., Marvel; Sund., Sunderman; Stew. Stewart; H-K., Holley-Kingston; Newc., Newcomb; Scheb., Schebler; Tillot., Tilloteon; Johns., Johnston. Fuel feed vacuum except where otherwise indicated. *Pressure. ♯Gravity. **Generator and Motor**—A-L., Auto-Lite; West., Westinghouse; ♯, Westinghouse or Auto-Lite; W-L., Ward-Leonard; Dyn., Dyneto; N. E., North East; L-N., Leece-Neville; A-C., Allis-Chalmers; Split., Splitdorf; S-H., Simms-Huff; G. & D., Gray & Davis. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; Eise., Eisemann; West., Westinghouse; Will., Willard; N. E., North East; K-Remy, Kingston-Remy; Berl., Berling; Bosch-W., Bosch-Westinghouse; Split., Splitdorf. **Gearset**—G-L., Grant-Lees; North., Northway; B-L., Brown-Lipe. **Rear Axle**—Col., Columbia; W-Weiss, Walker-Weiss; C-Timk., Cadillac-Timken; West-Mott, Weston-Mott. **Universals**—Hart., Hartford; Ther-H., Thermoid-Hardy; U. M. Co., Universal Machine Co. **Speedometer**—J-Man., Johns-Manville; V-Sicklen ,Van Sicklen; A-C., Allis-Chalmers.

Motor Age Monthly Passenger Car Specification Tables

These prices apply to five and seven-passenger models only.

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Size and Make	Gear Ratio	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Moon 6-68	7	2950	125	32x4½	Miller	3½x5½	Cont.	6	29.40	1½—Ray.	4.45	B. and B.	B-L	Spicer	Timken	Warner	Stewart	Firestone	6	110	Exide	Delco	Delco	Delco	6	Moon 6-68
Moore 30	5	1175	108	30x3½	Firestone	3x5	Own	4	14.40	1—Mar.	.....	Detlaff.	G-L	U. P.	Peru	Ditweiler	Stewart	Firestone	6	80	Willard	A-L	A-L	Conn.	6	Moore 30
Nash 681	5	1695	121	33x4	optional	3½-5½	Own	6	25.35	1½—Mar.	4.50	B. and B.	Own	Own	Own	Gemmer	Stewart	Firestone	6	100	Willard	Wagner	Wagner	Wagner	6	Nash 681
Nash 682	7	1875	127	34x4½	optional	3½x5½	Own	6	25.35	1½—Mar.	4.50	B. and B.	Own	Own	Own	Gemmer	Stewart	optional	6	100	Willard	Wagner	Wagner	Wagner	6	Nash 682
National Sextet BB	7	3750	130	32x4½	optional	3½x5½	Own	6	29.40	1½—Ray.	4.08	B. and B.	B-L	Arvac	Col.	Warner	Warner	Firestone	6	110	Prest.	West.	West.	Delco	6	National Sextet BB
Nelson D	5	1700	104	32x4	Goodyear	3½x4¾	Own	4	15.63	1—Zen.	4.25	Own	Own	Own	Own	Own	Stewart	Kelsey	12	72	Willard	U. S. L.	U. S. L.	Bosch	12	Nelson D
Noma 1-B	4	2900	128	32x4½	Goodyear	3½x4½	Cont.	6	25.35	1½—Zen.	4.45	B. and B.	Detroit	Spicer	Timken	Lavine	Stewart	Houk	6	104	Willard	Delco	Delco	Delco	6	Noma 1-B
Norwalk, 4-30	5	1385	116	32x3½	Firestone	3½x5	Lyc.	4	19.60	—Zen.	4.50	B. and B.	G-L	Universal	Peru	Ditweiler	Stewart	Firestone	10	....	Willlard	Dyn.	.....	Delco	6	Norwalk, 4-30
Oakland 34-C	5	1395	115	32x4	Goodyear	2 1/16x4½	Own	6	19.00	1—Mar.	4.50	Own	Muncie	Mechanics	West-Mott	Jacox	Stewart	Jaxon	6	.....	Prest.	Remy	Remy	Remy	6	Oakland 34-C
Ogren 6-60	6	3750	132	33x5	Goodyear	3½x5½	Own	6	29.40	1½—Ray.	4.10	Hoosier	Muncie	Hart	Col.	Lavine	Warner	Firestone	6	120	Willard	Bijur	Bijur	Bosch	6	Ogren 6-60
Oldsmobile 37-A	5	1450	112	32x4	Goodyear	2 1/16x4½	Own	6	18.99	1¼—John.	4.58	Own	Warner	Spicer	West. Mott	Jacox	Stewart	Jaxon	6	80	Willard	Remy	Remy	Remy	6	Oldsmobile 37-A
Oldsmobile 46-B	7	2100	122	33x4½	Goodyear	2½x4½	Own	8	26.45	1½—Ball.	4.91	Own	Warner	Spicer	West-Mott	Jacox	Stewart	Jaxon	6	80	Willard	Delco	Delco	Delco	6	Oldsmobile 46-B
Olympian 45	5	1585	112	32x3½	Goodyear	3¼x4½	Own	4	16.90	1 —Strom.	.....	B. and B.	Own	Detroit	Peru	Warner	Stewart	Perlman	6	.....	Willard	.....	.....	Conn.	6	Olympian 45
Overland 4	5	895	100	30x3½	Fisk	3½x4	Own	4	18.23	1—Tillot. #	4.50	Own	Own	Own	Own	Own	Stewart	Stanweld	....	80	U. S. L.	A-L	A-L	Conn.	6	Overland 4
Owen-Magnetic 60	7	7000	142	35x5	optional	4x5½	Own	6	38.40	1½—Zen.	3.87	Own	Own	Spicer	Stan-Par.	Own	Waltham	Firestone	24	.....	Exide	Own	Own	Berl.	28	Owen-Magnetic 60
Packard Twin Six	7	....	136	35x5	optional	3x5	Own	12	43.20	—Own*	4.36	Own	Own	Spicer	Own	Own	Waltham	Firestone	6	120	Willard	Bijur	Bijur	Delco	7	Packard Twin Six
Paige 6-42	5	1770	119	32x4	optional	3½x5	Own	6	23.44	1—Strom.	4.50	B. and B.	Own	Detroit	Salisbury	Jacox	Stewart	Kelsey	6	108	Willard	G. & D.	G. & D.	A-K	6	Paige 6-42
*Paige 6-66	7	2795	127	33x4½	optional	3½x5	Cont.	6	33.75	1½—Ray.	4.33	B. and B.	Own	Spicer	Salisbury	Jacox	Stewart	Kelsey	6	108	Willard	G. & D.	G. & D.	A-K	6	Paige 6-66
Paragon	....	....	122	.....	.....	3¾x5½	.....	4	22.50	.....	4.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Paragon
Parenti	5	2000	123	32x4	.....	.....	Own	6	....	—Zen.	4.50	B. and B.	Own	Ther-H	Own	Own	Stewart	Jaxon	6 8	84	U. S. L.	Bijur	Bijur	Conn.	.....	Parenti
Paterson 6-50	7	2130	120	33x4	optional	3½x4½	Cont.	6	25.35	1½—Strom.	4.50	B. and B.	Durston	Hartford	Stan-Par.	Jacox	Stewart	Jaxon	6	80	Willard	Delco	Delco	Delco	6	Paterson 6-50
Peerless Series 6	7	3230	125	34x4½	Goodyear	3½x5	Own	8	33.80	1⅛—Ball.	4.90	Own	Own	Spicer	Own	Gemmer	V. Sicklen	Firestone	6	125	Willard	A-L	A-L	A-K	6	Peerless Series 6
Phianna R	5	9500	125	32x4½	U. S.	3 3/32x6	Own	4	24.70	1½—Strom.	.....	Own	Own	Own	Amer.	Own	Warner	Firestone	6	.....	Willard	W-L	W-L	Bosch	6	Phianna R
Piedmont 4-30	5	1485	116	32x3½	Firestone	3½x5	Lyc.	4	19.60	1—Carter	4.45	B. and B.	G-L	Hartford	Peru	Ditweiler	Stewart	Firestone	6	90	Willard	Delco	Dyn.	Delco	6	Piedmont 4-30
Piedmont 6-40	5	1945	122	32x4	Firestone	3¼x4½	Cont.	6	25.35	1—Strom.	4.45	B. and B.	G-L	Norwalk	Spacke	Lavine	Stewart	Firestone	6	90	Willard	Remy	Remy	Remy	6	Piedmont 6-40
Pierce-Arrow 38	7	75 0	134	34x4½	Goodrich	4x5½	Own	6	38.40	—Own	3.78	Own	Own	Own	Own	Own	Waltham	Goodrich	6-8	135	.....	West.	West.	Delco	6	Pierce-Arrow 38
Pierce-Arrow 48	7	8000	142	35x5	Goodrich	4½x5½	Own	6	48.60	—Own	3.53	Own	Own	Own	Own	Own	Waltham	Goodrich	6-8	135	.....	West.	West.	Delco	6	Pierce-Arrow 48
Pilot 6-45	5	1895	120	32x4	Miller	3¼x5	Teetor	6	23.44	1—Tillot.	4.90	B. and B.	Muncie	Hart	Spacke	Ditweiler	Stewart	Standard	6	100	Prest.	Delco	Delco	Delco	6	Pilot 6-45
Porter 46	7	9400	142	35x5	U. S.	4.6x6½	Own	4	34.18	2½—Zen.	3.00	M. and E.	Own	.....	Own	Own	Stewart	Firestone	12	115	Prest.	West.	West.	Berl.	12	Porter 46
Premier 6-D	7	4600	126½	32x4½	Firestone	3½x5½	Own	6	27.34	1½—John.	4.50	B. and B.	Own	Peters	Stan-Par.	Warner	Own	Firestone	6	120	Willard	Delco	Delco	Delco	6	Premier 6-D
Premocar, 4-30	5	1350	118	32x3½	Firestone	3½x5	H-S	4	19.60	1—Zen.	4.50	B. and B.	Muncie	Universal	Timekem	Diuweiler	Stewart	Firestone	6	.....	Willard	Dyn.	Dyn.	Conn.	6	Premocar, 4-30
Ranger	4	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Ranger
Reo T-6	5	1850	120	33x4	U. S.	3 1/16x5	Own	6	24.30	1½—Ray.	4.66	Own	Own	Own	Own	Own	Stewart	Firestone	6	108	Willard	N. E.	N. E.	N. E.	6	Reo T-6
ReVere C	7	4650	131	32x4½	optional	4½x6	Duesenb'g	4	30.63	1½—Strom.	3.44	B-L	B-L	Spicer	Standard	Gemmer	Stewart	Houk	6	120	Willard	West.	West.	Bosch	6	ReVere C
Roamer C-6-54	8	3150	128	32x4½	Goodyear	3½x5½	Cont.	6	29.40	1¼—Strom.	.....	B. and B.	G-L	Ther-H	Stan-Par.	Jacox	Warner	Stanweld	6	90	Col.	Bijur	Bijur	Bosch	6	Roamer C-6-54
R & V Knight J	7	3350	127	32x4½	optional	3½x4½	Own	6	29.40	1½—Strom	4.90	B. and B.	B-L	Spicer	Timken	Jacox	Stewart	Firestone	6	117	Willard	Wagner	Wagner	Wagner	6	R & V Knight J
R & V Knight R	5	2150	115	32x4	optional	3¾x5	Own	4	22.50	1½—Strom	4.75	B. and B.	B-L	Spicer	Salisbury	Jacox	Stewart	Firestone	6	117	Willard	Wagner	Wagner	Wagner	6	R & V Knight R
Saxon	5	1785	112	32x4	.....	3⅜x5	Own	4	18.23	1½—Strom.	4.75	Own	Covert	Peters	Own	C. A. S.	Stewart	Firestone	6	80	Prest.	Wagner	Wagner	Wagner	6	Saxon
Sayers Six	5	2195	118	33x4	Goodyear	3½x4½	Cont.	6	25.35	1—Strom.	.....	B. and B.	G-L	Arvac	Stan-Par.	Warner	Stewart	Firestone	6	80	Willard	Delco	Delco	Delco	6	Sayers Six
Scripps-Booth B-39	5	1545	115	32x4	Goodyear	2 1/16x4½	North.	6	18.99	1—Mar.	4.50	North.	Warner	Peters	West-Mott	Jacox	Stewart	Kelsey	6	85	Prest.	Remy	Remy	Remy	6	Scripps-Booth B-39
Seneca L	5	1185	108	30x3½	Miller	3¼x4½	Le Roi	4	15.63	1—Scheb.	4.75	B. and B.	Warren	Universal	Peru	Ditweiler	Stewart	Jaxon	6	88	Prest.	A-C	A-C	Conn.	6	Seneca L
Severin H	5	2550	122½	32x4½	Miller	3½x5½	Cont.	6	29.40	—Strom.	4.50	B. and B.	Muncie	Peters	Salisbury	Lavine	Stewart	Firestone	6	110	Camp.	Wagner	Wagner	Wagner	6	Severin H
S. G. V.	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	S. G. V.
Shaw	7	5500	136	33x5	Firestone	2 7/16x5	Wied.	12	39.68	—Strom.	.....	B-L	B-L	.....	Timken	Jacox	Warner	Firestone	.....	.....	.....	West.	West.	Bosch	.....	Shaw
Singer 20	7	6500	138	33x5	Goodyear	2¾x5	Weid.	12	39.68	1½—Strom.	3.77	Covert	Covert	Spicer	Timken	Ross	Stewart	Own	6	162	Willard	West.	West.	Phil.	6	Singer 20
Skelton	5	1295	112	32x3½	optional	3½x5	Lycoming	4	19.60	1—Carter	4.25	B. and B.	Muncie	Universal	Peru	C. A. S.	Stewart	Stanweld	6	85	Prest.	West.	West.	Conn.	6	Skelton
Spacke S-20	2	345	90	28x3	U. S.	3½x3.67	Own	2	9.80	1—Carter #	5.09	Own	Own.....	....	Own	Own.....	.....	.....	.....	.....	.....	.....	.....	A-K	.....	Spacke S-20
Standard 8-I	7	....	127	34x4½	optional	3¼x5	Own	8	33.80	1¼—Zen.	4.45	B. and B.	G-L	Arvac	Timken	Gemmer	Stewart	Firestone	6	160	Willard	West.	West.	Opt.	6	Standard 8-I
Stanwood	5	2050	118	33x4	Firestone	3¼x4½	Cont.	6	.....	1½—Strom.	4.50	B. and B.	G-L	Peters	Stan-Par.	Gemmer	.....	Stanweld	6	.....	Willard	West.	West.	A-K	.....	Stanwood

Engines—Ruten., Rutenber; Cont., Continental; Weid., Weidely; North., Northway; H-S., Herschell-Spillman; Lyco., Lycoming; D-Lyco., Dort-Lycoming; G. B. & S., Golden, Belknap & Swarts; T-McTeetor-McFarlan; #, Monson or Duesenberg; R. & V., Root & Van Dervoort. **Carburetor**—Strom., Stromberg; Zen., Zenith; Ray., Rayfield; John., Johnson; Mar., Marvel; Sund., Sunderman; Stew. Stewart; H-K., Holley-Kingston; Newc., Newcomb; Scheb., Schebler; Tillot., Tillotson; Johns., Johnston. Fuel feed vacuum except where otherwise indicated. *Pressure. #Gravity. **Generator and Motor**—A-L., Auto-Lite; West., Westinghouse; #, Westinghouse or Auto-Lite; W-L., Ward-Leonard; Dyn., Dyneto; N. E., North East; L-N., Leece-Neville; A-C., Allis-Chalmers; Split., Splitdorf; S-H. Simms-Huff; G. & D., Gray & Davis. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; Eise., Eisemann; West., Westinghouse; Will., Willard; N. E., North East; K-Remy, Kingston-Remy; Berl., Berling; Bosch-W., Bosch-Westinghouse; Split., Splitdorf. **Gearset**—G-L., Grant-Lees; North., Northway; B-L., Brown-Lipe. **Rear Axle**—Col. Columbia; W-Weiss Walker-Weiss; C-Timk. Cadillac-Timken; West-Mott Weston-Mott. **Universals**—Hart. Hartford; Ther-H. Thermoid-Hardy; U. M. Co. Universal Machine Co. **Speedometer**—J-Man. Johns-Manville; V-Sicklen Van Sicklen; A-C. Allis-Chalmers. * 1921 Model

STEAM CARS

Name and Model	Seating Capacity	Price	Wheelbase	Rear Tire Size	Make of Tire	Bore and Stroke	Engine Make	No. Cylinders	N. A. C. C. HP.	Carburetor Size and Make	Gear Ratio	Clutch	Gearset	Universals	Rear Axle	Steering Gear	Speedometer	Rims	Battery Volts	Battery Amp.	Battery Make	Generator Make	Motor Make	Ignition Make	Lamp Voltages	Name and Model
Stearns S KLA	5	2450	125	34x4½	Goodrich	3½x5½	Own	4	22.50	1½—Scheb.	4.50	Own	Own	Spicer	Own	Own	V. Sicklen	Firestone	12	65	Willard	West.	West.	A-K	12	Stearns SKL-4
Stephens 80	6	2400	122	33x4½	Fisk	3½x4½	R & V	6	25.35	1½—Tillot.	4.75	B. and B.	Mechanics	Mechanics	Stan-Par	C. A. S.	Stewart	Stanweld	6-8	116	U. S. L.	A-L	Conn.	Conn.	6	Stephens 80
Stevens-Duryea	7	3000	138	35x5	optional	4½x5½	Own	6	47.25	—Strom.	.....	Own	Own	Own	Own	Own	Waltham	Firestone	6	.....	.....	West.	West.	Berl.	6	Stevens-Duryea
Studebaker E-J	5	1485	112	32x4	.....	3½x4½	Own	6	23.44	—Strom.	4.55	Own	Own	.....	Own	Own	Stewart	Kelsey	6	80	Willard	Wagner	Wagner	Remy	6	Studebaker E-J
Studebaker E-G	7	2150	126	33x4½	Goodyear	3½x5	Own	6	36.04	1½—Ball.	3.70	Own	Own	Spicer	Own	Own	V. Sicklen	Kelsey	6	80	Willard	Wagner	Wagner	Remy	6	Studebaker E-G
Studebaker E-H	5	1750	119	32x4	.....	3½x5	Own	6	29.40	1½—Strom.	4.33	Own	Own	Spicer	Own	Own	V. Sicklen	Kelsey	6	80	Willard	Wagner	Wagner	Delco	6	Studebaker E-H
Stutz H	6	3600	130	32x4½	optional	4½x6	Own	4	30.63	1½—Strom.	3.50	Own	Own	Own	Own	Gemmer	Warner	.....	6	130	Willard	Remy	Bijur	Simms	6	Stutz H
Templar A-445	5	2885	118	32x4	optional	3½x5½	Own	4	18.23	1½—Strom.*	4.40	B. and B.	Detroit	Hardy	Own	C. A. S.	Stewart	Firestone	6	100	Prest.	Bijur	Bijur	Simms	6	Templar A-445
Texan B-38	5	1495	115	33x4	Southland	3½x5	Lyc.	4	19.60	—Car.	.....	B. and B.	G-L	Detroit	Pern	C. A. S.	Stewart	Stanweld	6	80	Exide	Prest.	Bijur	Conn.	6	Texan B-38
Tulsa E	5	1550	117½	33x4	Firestone	5x3½	H-S	4	19.60	1½—Zen.	4.50	B. and B.	Muncie	.....	Salisbury	C. A. S.	V. Sicklen	Firestone	6	120	Willard	Bijur	Dyn.	Conn.	6	Tulsa E
Velie 48	5	1885	115	32x4	Goodyear	3½x4½	Cont.	6	25.35	1½—Ray.	4.66	B. and B.	Durston	Arvac	Timken	Gemmer	V. Sicklen	Firestone	6	100	Willard	Bijur	Bijur	A-K	6	Velie 48
Velie 34	5	1585	112	32x3½	optional	3½x4½	Falls	6	23.44	—Ray.	4.60	B. and B.	Durston	Arvac	Col.	Gemmer	V. Sicklen	Firestone	6	100	Willard	West.	West.	A-K	6	Velie 34
Vogue 6-55	5	2285	124	32x4	Goodrich	3½x5	H-S	6	25.35	—Scheb.	4.50	B. and B.	Warner	Norwalk	Salisbury	Ditweiler	Stewart	Firestone	6	108	Willard	A-L	A-L	Conn.	6	Vogue 6-55
Vogue 6-66	5	2485	124	33x4½	Goodrich	3½x5½	Cont.	6	29.40	—Scheb.	4.50	B. and B.	Warner	Norwalk	Salisbury	Ditweiler	Stewart	Firestone	6	108	Willard	A-L	Conn.	Conn.	6	Vogue 6-66
Wasp	4	6500	132	33x5	Firestone	4½x5½	Wis.	4	36.10	1½—Strom.	3.10	.....	Covert	Spicer	Timken	Gemmer	V. Sicklen	Firestone	6	145	Exide	West.	West.	Bosch	6	Wasp
Westcott C-38	5	2690	118	33x4	Firestone	3½x4½	Cont.	6	25.35	1½—Ray.	5.09	B. and B.	Warner	Peters	Timken	Gemmer	V. Sicklen	Firestone	6	117	Willard	Delco	Delco	Delco	6	Westcott C-38
Westcott C-48	7	3190	125	32x4½	Firestone	3½x5½	Cont.	6	29.40	1½—Ray.	4.45	Warner	Warner	Peters	Timken	Gemmer	V. Sicklen	Firestone	6	117	Willard	Delco	Delco	Delco	6	Westcott C-48
Willys-Knight 20	5	2195	118	33x4	Fisk	3½x4½	Own	4	21.03	1—Tillot.*	5.00	Own	Own	Ther-H.	Own	Own	Stewart	Stanweld	6	170	U. S. L.	A-L	Conn.	Conn.	6	Willys-Knight 20
Winther 61	5	.....	120	33x4	Goodyear	3½x5	H-S	6	25.35	1½—Strom.	4.50	Warner	Warner	Peters	Spacke	Lavine	Stewart	Firestone	6	127	Willard	West.	West.	Bosch	6	Winther 61
Winton 25	7	4000	132	35x5	optional	3½x5½	Own	6	33.75	1½—Strom.	4.90	.....	.....	.....	.....	.....	Warner	Firestone	6	120	Willard	Bijur	Bijur	Bosch	6	Winton 25
Stanley 735-B	7	4875	130	34x4½	Optional	4-5	Own	2	20.00	none	none	none	none	none	Own	.....	V. Sicklen	Firestone	6	116	Willard	Remy	None	None	6	Stanley 735-B

Engines—Ruten., Rutenber; Cont., Continental; Weid., Weidely; North., Northway; H-S., Herschell-Spillman; Lyco., Lycoming; D-Lyco., Dort-Lycoming; G. B. & S., Golden, Belknap & Swartz; T-McTeetor-McFarlan; #, Monson or Duesenberg; R. & V., Root & Van Dervoort. **Carburetor**—Strom., Stromberg; Zen., Zenith; Ray., Rayfield; John., Johnson; Mar., Marvel; Sund., Sunderman; Stew, Stewart; H-K., Holley-Kingston; Newc., Newcomb; Scheb., Schebler; Tillot., Tillotson; Johns., Johnston. **Fuel feed** vacuumexcept where otherwise indicated. *Pressure. #Gravity. **Generator and Motor**—A-L., Auto-Lite; West., Westinghouse or Auto-Lite; #, Westinghouse or Auto-Lite; W-L., Ward-Leonard; Dyn., Dyneto; N. E., North East; L-N., Lecce-Neville; A-C., Allis-Chalmers; Split, Splitdorf; S-H., Simms-Huff; G. & D., Gray & Davis. **Ignition**—A-K., Atwater-Kent; Conn., Connecticut; Eise., Eisemann; West., Westinghouse; Will., Willard; N. E., North East; K-Remy, Kingston-Remy; Berl., Berling; Bosch-W., Bosch-Westinghouse; Split., Splitdorf. **Gearset**—G-L., Grant-Lees; North., Northway; B-L., Brown-Lipe. **Rear Axle**—Col., Columbia; W-Weiss, Walker-Weiss; C-Timk., Cadillac-Timken; West-Mott, Weston-Mott. **Universals**—Hart., Hartford; Ther-H., Thermoid-Hardy; U. M. Co., Universal Machine Co. **Speedometer**—J-Man., Johns-Manville; V-Sicklen, Van Sicklen; A-C., Allis-Chalmers.

Truck Association Planning for New York Show in January

New York, Oct. 1—A motor truck show will be held in this city Jan. 3-8, according to plans now being formed by the Motor Truck Association of America of which T. D. Pratt is general manager. The building tentatively selected is the Twelfth Regiment Armory, at Columbus Avenue and West 62d Street, two blocks from Broadway. The date is the week before the passenger car show.

Following the mammoth show of last year in the Bronx, remote from downtown New York, the truck show matter has been much discussed with the result that the National Automobile Chamber of Commerce decided not to stage truck shows this year. The New York Automobile Dealers Association then considered the project but recently dropped its plans. The Motor Truck Association is an organization of fleet owners with a considerable dealer membership.

TRUCK COMPANY TO AID DEALERS

Wabash, Ind., Oct. 1—Sales managers representing every division of the United States were present at a convention of of the Division Sales Managers of the Service Motor Truck Co. held here recently. The main point under discussion was as to means to help dealers in their resale work. The factory does not consider that it has made a sale when the truck is sold to the dealer inasmuch as the sale is not completed until the truck is delivered to the ultimate consumer. Plans were made for dealers follow-up work.

MAKING MORE MONEY FROM OILING RACKS

(*Concluded from page 13*)

There is no escaping the fact, that probably the majority of motorists, with garages of their own, will neglect to give their machines proper attention in all particulars, either through ignorance or sheer neglect. Ordinaily motoists will "let it go" until they are compelled by some serious trouble that has developed to give their car to mechanics. Of course, they will probably give their car a cursory oiling and greasing at times but in all probability many will be the grease cups that an average motorist never knew existed on his machine.

Such neglect not only works to the injury of the motorist himself but to the agency that sold him the machine because it cannot be expected to do itself justice upon failure to receive its just attention.

The motorist knows that he can drive up on the tracks and have his car systematically oiled and greased and his crankcase and differentials cleaned with little delay. "While you wait" is a slogan that has come to have a wide appeal to busy Americans.

At a station such as this, the motorist can drive from the street into the lot and up on the racks. If he chooses he can remain in his car while the job is being done.

From the Four Winds

Glimpses at the World of Motordom

COMING MOTOR EVENTS

Automobile Shows

Little Rock, Ark.	Closed Car Show	Oct. 4-9
Minneapolis	Closed Car Show	Oct. 5-9
Northampton, Mass.	Annual Automobile Show	Oct. 6-8
Dallas, Texas	Automobile Show	Oct. 9-24
Atlanta, Ga.	Automobile Show	Oct. 16-26
New York	Automobile Salon	Nov. 14-21
Chicago	Automotive Equipment Show	Nov. 15-20
Jersey City, N. J.	Annual Automobile Show	Nov. 15-20
Houston, Texas	Automobile Show	Nov. 20-28
New York	National Passenger Car Show	Jan. 8-15, 1921
Milwaukee	Annual Winter Show	Jan. 14-21, 1921
Schenectady, N. Y.	Annual Automobile Show	Jan. 16-22, 1921
Amsterdam, N. Y.	Annual Automobile Show	Jan. 23-29, 1921
Chicago	National Passenger Car Show	Jan. 29-Feb. 4, 1921
Hudson, N. Y.	Annual Automobile Show	Jan. 30-Feb. 5, 1921
Minneapolis	Winter Show	Feb. 5-12, 1921
Newberg, N. Y.	Annual Automobile Show	Feb. 6-12, 1921
Kansas City, Mo.	Annual Automobile Show	Feb. 12-19, 1921
Pittsfield, Mass.	Annual Automobile Show	Feb. 20-26, 1921
Deadwood, S. D.	Annual Automobile Show	Feb. 21-26, 1921

Tractor Shows

Columbus, O.	National Tractor Show	Feb. 6-12, 1921

Foreign Shows

London	Commercial Vehicles, Exhibition, Olympia	October
London	Passenger Car Show, Olympia	Nov. 4-13
Christchurch, N. Z.	Olympia Motor Exhibition	Nov. 6-13
Brussels	Automobile Show	Dec. 10
Sydney, Australia	Motor Show	Jan. 7, 1921

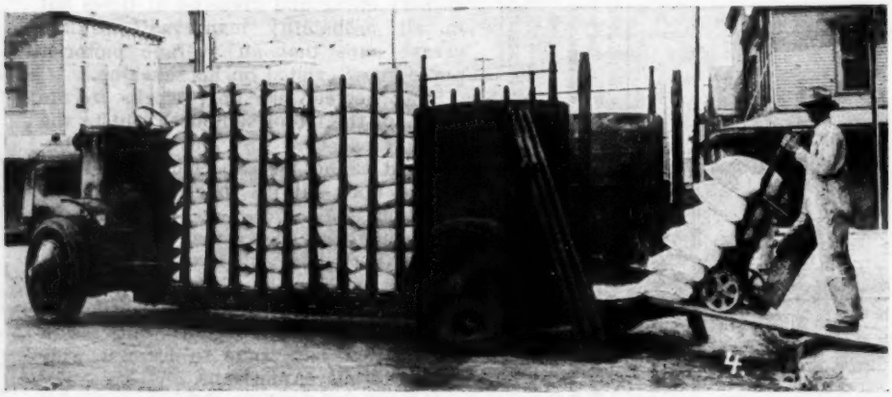
Races

Los Angeles, Cal.	Dirt Track	Nov. 25

Conventions

Greensboro, N. C.	Carolina Automotive Trade Assn.	Sept. 24-25
Cleveland	Service Managers' Convention	October
Gulfport, Miss.	Louisiani-Mississippi Automotive Trade Assn. semi-annual meeting	Oct. 6-7
Salina, Kan.	Auto Trades Assn. of Kansas, Annual Convention	Oct. 20
Atlantic City	National Implement and Vehicle Assn. Twenty-seventh Annual Convention	Oct. 20-21-22
Cincinnati	Ohio Automobile Trade Assn. Fourth Annual Convention	Dec. 8-10
Cincinnati	Annual Convention Ohio Automobile Jobbers' Assn.	Dec. 8-9
Columbia, S. C.	Annual Meeting South Carolina Automotive Trade Assn.	Dec. 9-10
Milwaukee	Wisconsin Automotive Dealers' Assn.	Jan. 19, 1921
Chicago	N. A. D. A. Annual Meeting	Jan. 31-Feb. 1, 1921

Motor Trucks Designed for Any Need



A new truck has made its appearance, which has many advantages, and many new mechanical features. Front wheel drive, three point suspension of the load frame with the engine resting on a separate set of springs, entirely removed from road shock and cushioned , hydraulic steering gear and hydraulic brakes. This steering gear permits of ease of maneuvering in congested places. The load carrying capacity is limited only to the tires and the roads

BUSINESS NOTES

The Acme Body Works, established a year ago at Appleton, Wis., has started work on the fourth factory addition made since that time. The company is 200 orders behind and operating at full capacity. From thirty to thirty-five bodies are being turned out weekly. Ten large omnibus bodies are in process. Both passenger and commercial car bodies are manufactured.

The Miller-Maynard Motor Co., Columbus, has been organized to handle the Winton and Metz in central Ohio terrirtory.

The Western Vulcanizer Mfg. Co., Chicago, manufacturers of the "Dri-Kure-Retreder," have added 35,000 sq. ft. of floor space due to greater domestic demand for their products and greatly increased export trade. New boring mills, lathes and special machienry have been installed. The foreign buisness of the company has more than tripled in the past five months.

J. Ralph Seidner, Youngstown, Ohio, has closed a contract for a large territorial distribution of the Parenti automobile, the territory embracing Pittsburgh, where he will establish a branch. He will operate all his territory from Youngstown.

Peace & Lewis, Plainview, Texas, has changed its name to the Lewis Rubber Co. and is moving to Dallas. Though the name of the firm has been changed, the personnel of the company will remain the same.

The A. J. Alsdorf Corp., who are acting as exclusive distributors in export for a number of leading manufacturers of automobile accessories, have been appointed exclusive distributors for the Norlund Novelty Co., Williamsport, Pa., manufacturers of Norlund Safety Jacks.

The W. E. Seymour Mfg. Corp. of Milwaukee is the name of a new corporation organized with an authorized capitalization of $200,000 to engage in the production of automotive materials, parts and accessories. The prime mover in the enterprise is W. E. Seymour, who retired recently as vice-president and general manager of the A. O. Smith Corp. of this city.

The Roller-Smith Co. has named as its agent in Colorado, Wyoming and New Mexico the Mountain States Machinery Co. of Denver which will also handle the products of the Crocker-Wheeler Co., Maloney Electric Co., Cutler-Hammer Mfg. Co. and the Terry Steam Turbine Co.

The Link-Belt Co. has published an engineering data book on the subject of the use of the Link-Belt roller chain as a means of power transmission which can be secured from the Chicago office of the company or any of its branches.

The India Tire & Rubber Co. has appointed the Allen & Guard Tire Co. as distributors for India tires in Denver and the General Auto Supply Co., in Richmond, Va.

The Harvey Spring & Forging Co., Racine, Wis., manufacturers of the Harvey Boltless Auto Spring, have opened a Chicago branch at 3020 South Michigan boulevard, with Edward Murphy in charge. A complete assortment of Harvey springs of all sizes will be kept in stock in order to permit quick deliveries to Chicago dealers.

International Harvester Co. has opened a new sales and service station in Grand Rapids and has appointed Armock & Meek as distributors of International trucks.

Olds Motor Works has opened a new service station devoted exclusively to Oldsmobile service in Saginaw. Rapid increase in the sale of Oldsmobile cars and trucks in the territory compelled the installation of the new station.

The Eclipse Mfg. Co., Indianapolis, has taken over the distribution of the Savidge line of valve tools.